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Service
Service
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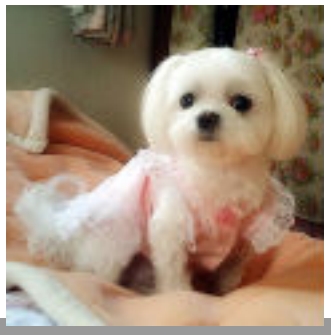
For manual LGE plasma panel see: 3122 785 15590



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Service Manual

Contents

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

1.1 Technical Specifications

1.1.1 Vision

Display type	:	Plasma
Screen size	:	42” (107 cm), 16:9
Screen size	:	50” (127 cm), 16:9
Resolution (HxV pixels)	:	42 inch: 852 x 480
	:	50 inch: 1366 x 768
Contrast ratio	:	
- 42PF7320 /79 /93 /98	:	13,000:1
- 50PF7320 /79 /93 /98	:	10,000:1
Light output (cd/m^2)	:	1500
Viewing angle (HxV degrees)	:	160x160
Tuning system	:	PLL
TV Colour systems	:	PAL B/G, D/K, I
	:	SECAM B/G, D/K, L/L’
Video playback	:	PAL B/G; SECAM L/L’
	:	NTSC M/N 3.58, 4.43
Supported computer formats	:	VGA (640x480)
	:	VGA (720x400)
	:	VGA (720x480)
	:	MAC (640x480)
	:	MAC (832x624)
	:	SVGA (800x600)
	:	XVGA (1024x768)
	:	WXGA (1280x768)
	:	WXGA (1280x960)
	:	WXGA (1280x1024)
Supported video formats	:	640x480i - 1fH
	:	720x576i - 1fH
	:	640x480p - 2fH
	:	720x576p - 2fH
	:	852x480p - 2fH
	:	1920x1080i - 2fH
Presets/channels	:	100/125 presets
Tuner bands	:	VHF
	:	UHF
	:	S-band
	:	Hyper-band

1.1.2 Sound

Sound systems	:	FM-mono
	:	FM-stereo B/G
	:	NICAM B/G, D/K, I, L
	:	AV Stereo
Maximum power (W_{RMS})	:	2 x 15

1.1.3 Miscellaneous

Power supply:		
- Mains voltage (V_{AC})	:	220 - 240
- Mains frequency (Hz)	:	50 / 60
Ambient conditions:		
- Temperature range (°C)	:	+5 to +40
- Maximum humidity	:	90% R.H.
Power consumption		
- Normal operation (W)	:	≈ 450
- Stand-by (W)	:	< 2
Dimensions (WxHxD cm)	:	42 inch: 124x68x10.4
	:	50 in.:141.5x78x10.4
Weight (kg)	:	42 inch: 38
	:	50 inch: 50

1.2 Connection Overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Side I/O connections

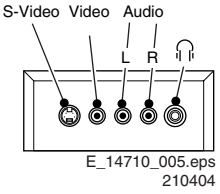

Figure 1-1 Side I/O connections

S-Video (Hosiden): Video Y/C - In

1	- Ground Y	Gnd	⏚
2	- Ground C	Gnd	⏚
3	- Video Y	1 V_{PP} / 75 ohm	→
4	- Video C	0.3 V_{PP} / 75 ohm	→

Cinch: Video CVBS - In, Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 ohm	→◎
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	→◎
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	→◎

Mini Jack: Audio Head phone - Out

Bk	- Head phone	32 - 600 ohm / 10 mW	◎♪/🎧

1.2.2 Rear Connections

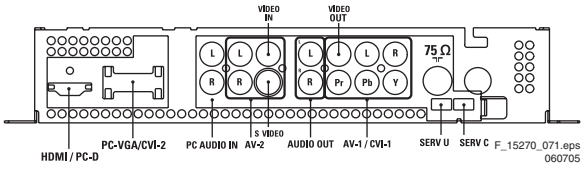

Figure 1-2 Rear I/O

Aerial - In

-	- IEC-type (EU)	Coax, 75 ohm	⊤

Cinch: Video CVBS - In, Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 ohm	→◎
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	→◎
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	→◎

Cinch: Video CVBS - Out, Audio - Out

Ye	- Video CVBS	1 V_{PP} / 75 ohm	→◎
Wh	- Audio L	0.5 V_{RMS} /10 kohm	→◎
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	→◎

Cinch: CVI-1 Video YPbPr - In

Gn	- Video Y	1 V_{PP} / 75 ohm
Bu	- Video Pb	0.7 V_{PP} / 75 ohm
Rd	- Video Pr	0.7 V_{PP} / 75 ohm

Cinch: CVI-1 Audio - In

Rd	- Audio - R	0.5 V_{RMS} / 10 kohm
Wh	- Audio - L	0.5 V_{RMS} / 10 kohm

Cinch: PC Audio - In

Rd	- Audio - R	0.5 V_{RMS} / 10 kohm
Wh	- Audio - L	0.5 V_{RMS} / 10 kohm

S-Video (Hosiden): Video Y/C - In

1	- Ground Y	Gnd
2	- Ground C	Gnd
3	- Video Y	1 V_{PP} / 75 ohm
4	- Video C	0.3 V_{PP}P / 75 ohm

Service connector (ComPair)

1	- SDA-S	I^2C Data (0 - 5 V)
2	- SCL-S	I^2C Clock (0 - 5 V)
3	- Ground	Gnd

Service connector (UART)

1	- UART_TX	Transmit
2	- Ground	Gnd
3	- UART_RX	Receive

HDMI/PC-D: Digital Video, Digital Audio - In

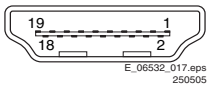

Figure 1-3 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel
8	- Shield	Gnd
9	- D0-	Data channel
10	- CLK+	Data channel
11	- Shield	Gnd
12	- CLK-	Data channel
13	- n.c.	
14	- n.c.	
15	- DDC_SCL	DDC clock
16	- DDC_SDA	DDC data
17	- Ground	Gnd
18	- +5V	
19	- HPD	Hot Plug Detect
20	- Ground	Gnd

PC VGA/DVI-2: Video 2fH RGB/YPbPr - In

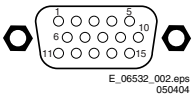

Figure 1-4 VGA Connector

1	- Video Red/Pr	0.7 V_{PP} / 75 ohm
2	- Video Green/Y	0.7 V_{PP} / 75 ohm
3	- Video Blue/Pb	0.7 V_{PP} / 75 ohm
4	- n.c.	
5	- Ground	Gnd
6	- Ground Red	Gnd
7	- Ground Green	Gnd
8	- Ground Blue	Gnd
9	- +$5V_{DC}$	+5 V
10	- Ground Sync	Gnd
11	- n.c.	
12	- DDC_SDA	DDC data
13	- H-sync	0 - 5 V
14	- V-sync	0 - 5 V
15	- DDC_SCL	DDC clock

1.3 Chassis Overview

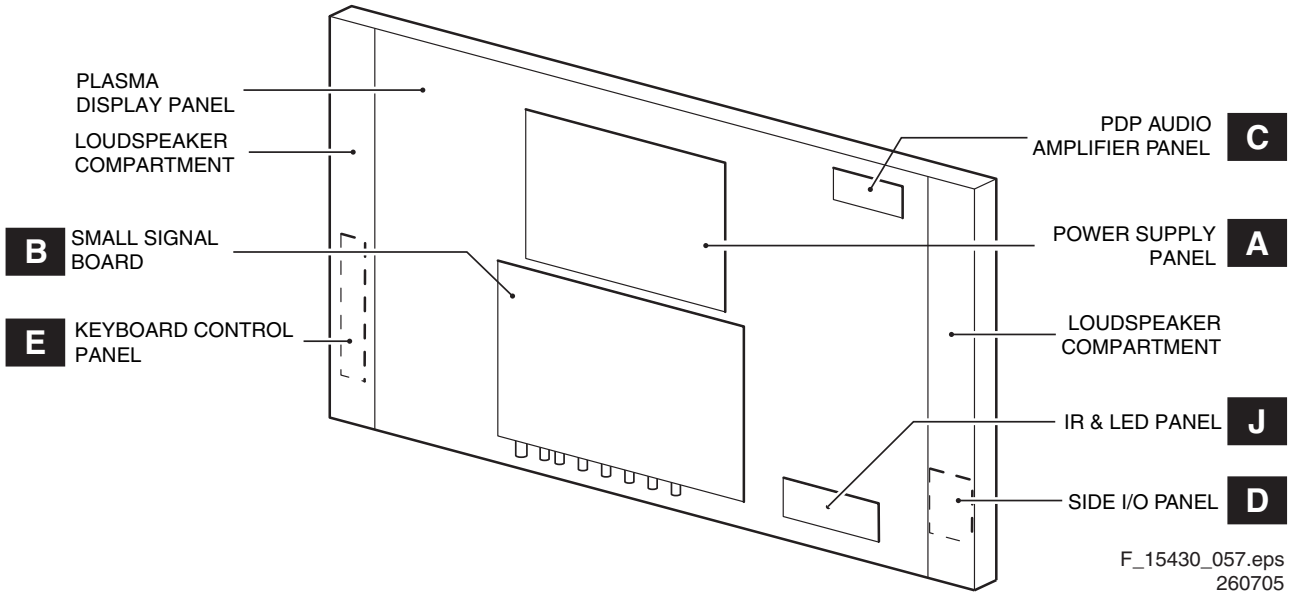

Figure 1-5 PWB locations

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

2.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains (AC Power) via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains (AC Power) lead for external damage.
- Check the strain relief of the Mains (AC Power) cord for proper function.
- Check the electrical DC resistance between the Mains (AC Power) plug and the secondary side (only for sets that have a Mains (AC Power) isolated power supply):
  1. Unplug the Mains (AC Power) cord and connect a wire between the two pins of the Mains (AC Power) plug.
  2. Set the Mains (AC Power) switch to the "on" position (keep the Mains (AC Power) cord unplugged!).
  3. Measure the resistance value between the pins of the Mains (AC Power) plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the Mains (AC Power) plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential. Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads (μ= x10^{-6}), nano-farads (n= x10^{-9}), or pico-farads (p= x10^{-12}).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, is being removed, it is essential when removing an (LF)BGA, that the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature.
A uniform temperature reduces the risk of warping the PWB. To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.

After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.
Note: Do not apply solder paste, as this has been shown to result in problems during re-soldering.

Device Replacement
The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information
For more information on how to handle BGA devices, visit this URL: *www.atyourservice.ce.philips.com* (needs subscription, not available for all regions). After login, select “Magazine”, then go to “Workshop Information”. Here you will find Information on how to deal with BGA-ICs.

2.3.4 Lead-free Solder

Philips CE is producing lead-free sets (PBF) from 1.1.2005 onwards.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 5 and 6 refer to the production year, digits 7 and 8 refer to production week (in example below it is 1991 week 18).

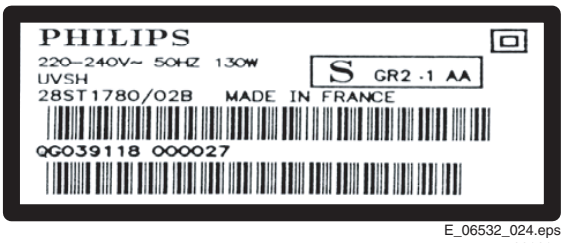

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Figure 2-1 Serial number example

Regardless of the special lead-free logo (which is not always indicated), one must treat all sets from this date onwards according to the rules as described below.

Figure 2-2 Lead-free logo

Due to lead-free technology some rules have to be respected by the workshop during a repair:
- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilise the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilised at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.
- Use only original spare-parts listed in the Service-Manuals. Not listed standard material (commodities) has to be purchased at external companies.
- Special information for lead-free BGA ICs: these ICs will be delivered in so-called "dry-packaging" to protect the IC against moisture. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets "wet" inside and during the heating time the structure of the IC will be destroyed due to high (steam-) pressure inside the body. If the packaging was opened before usage, the IC has to be heated up for some hours (around 90°C) for drying (think of ESD-protection!).
  Do not re-use BGAs at all!
- For sets produced before 1.1.2005, containing leaded soldering tin and components, all needed spare parts will be available till the end of the service period. For the repair of such sets nothing changes.

In case of doubt whether the board is lead-free or not (or with mixed technologies), you can use the following method:
- Always use the highest temperature to solder, when using SAC305 (see also instructions below).
- De-solder thoroughly (clean solder joints to avoid the mixing of two alloys).

Caution: For BGA-ICs, you **must** use the correct temperature profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *www.atyourservice.ce.philips.com* (needs subscription, but is not available for all regions).
You will find this and more technical information within the "Magazine", chapter "Workshop information".
For additional questions please contact your local repair help desk.

2.3.5 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3. Directions for Use

You can download this information from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

4. Mechanical Instructions

Index of this chapter:

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassembling instructions in described order.

4.1 Cable Dressing

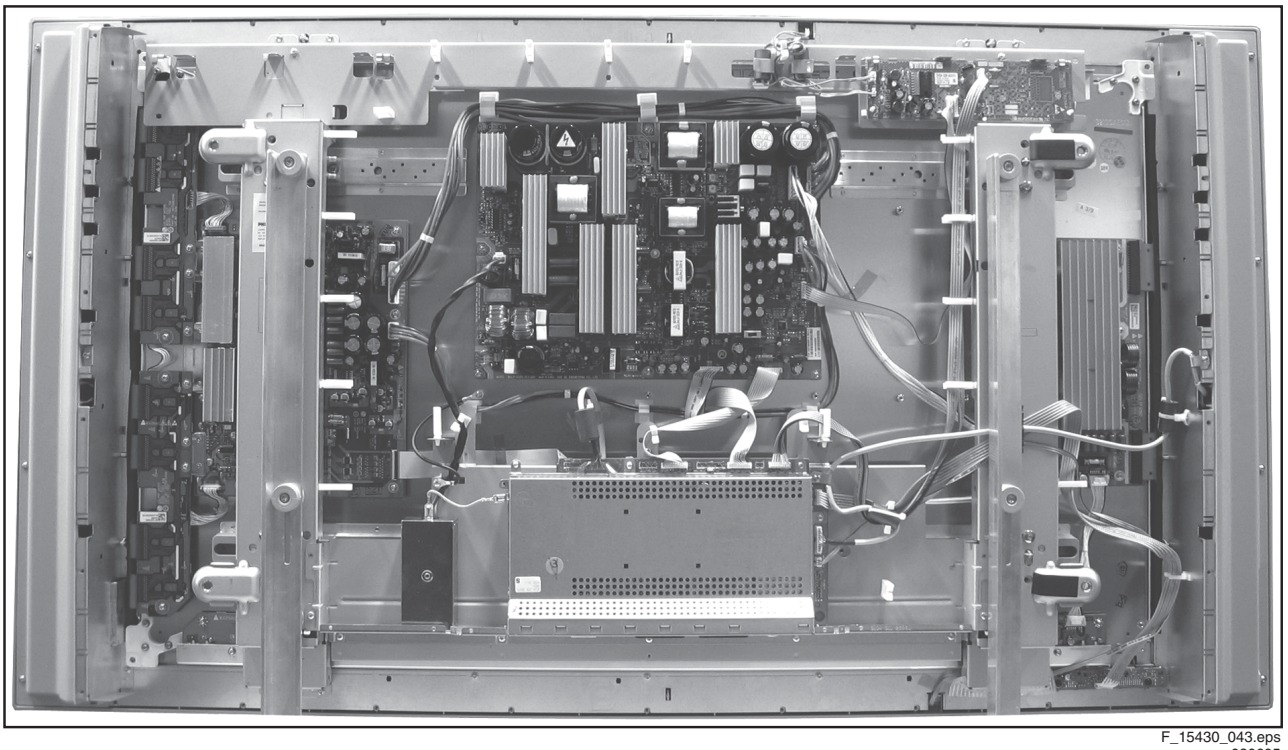

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Figure 4-1 Cable dressing

4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:

- The buffers from the packaging (see figure "Rear cover").
- Foam bars (created for service).
- Aluminium service stands (created for Service).

4.2.1 Foam Bars

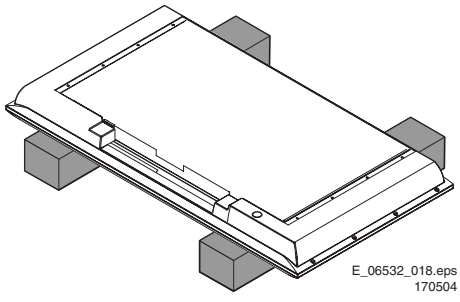

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Figure 4-2 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments.
By placing a mirror under the TV, you can monitor the screen.

4.2.2 Aluminium Stands

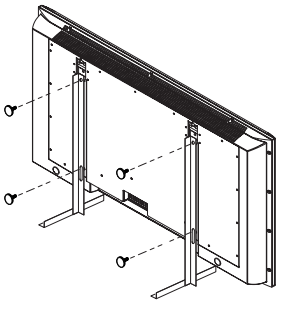

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Figure 4-3 Aluminium stands (drawing of MkI)

The aluminium stands (order code 3122 785 90480) can be mounted with the back cover removed or still left on. So, the stand can be used to store products or to do measurements. It is also very suitable to perform duration tests without taking much space, without having the risk of overheating, or the risk of products falling. The stands can be mounted and removed

quick and easy with use of the delivered screws that can be tightened and loosened manually without the use of tools. See figure above.

Note: Only use the delivered screws to mount the monitor to the stands.

4.3 Assy/Panel Removal

4.3.1 Metal Rear Cover

Caution: Disconnect the Mains/AC Power cord before you remove the rear cover!

1. Place the TV set upside down on a table top, using the foam bars (see part "Foam Bars").
   Caution: do **not** put pressure on the display, but let the monitor lean on the speakers or the Front cover.
2. Remove all T10 screws around the edges of the metal rear cover: “parker” screws around the outer rim, “tapping” screws around the connector plate.
3. Remove the four "mushrooms" from the rear cover.
4. Lift the metal rear cover from the set. Make sure that wires and flat foils are not damaged.

4.3.2 Speaker Compartment Cover

After removing the metal rear cover, you gain access to the Speaker Compartment covers.

1. Remove all T10 screws [1] around the outer rim of the cover (see Figure “Speaker compartment cover removal”).
2. Remove the T10 screws [2] on top of the inner rim, including the one which secures the grounding clamp (3, see Figure “Grounding clamp”).
3. Now, remove the plastic cable fixation noose (4, see Figure “Cable fixation noose”).
4. After removal of all the screws, slightly push the top of the cover inwards. This will lift the outer rim slightly up so you can take the cover out.

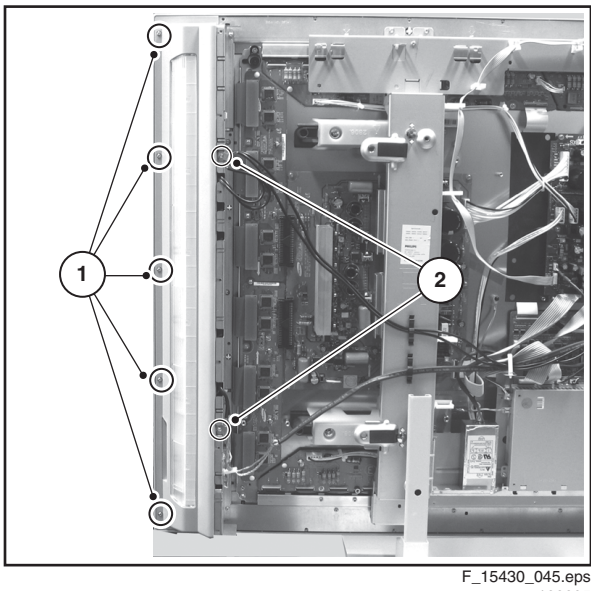

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Figure 4-4 Speaker compartment cover removal

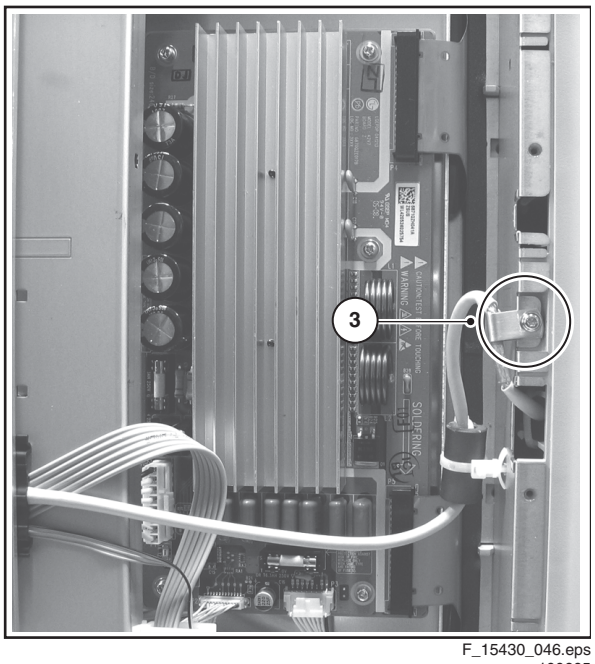

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Figure 4-5 Grounding clamp

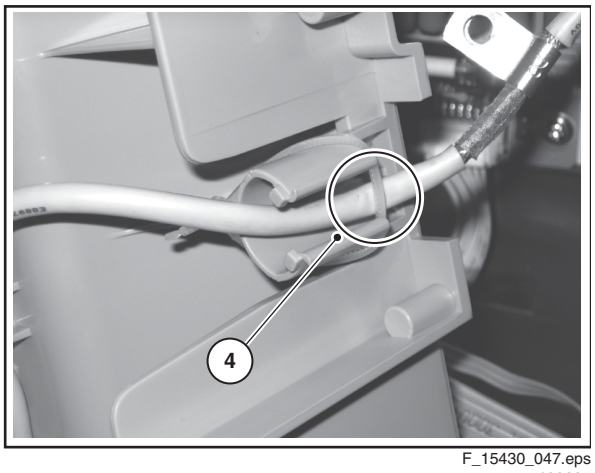

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Figure 4-6 Cable fixation noose

4.3.3 Side I/O Panel

After removal of the Speaker Compartment Covers, this panel is accessible.

1. Disconnect the cable (1) from the panel.
2. Remove the T10 mounting screws [2] that hold the assy.
3. Remove the panel from its bracket [3], by pushing against the front side of the side I/O cinch connectors.

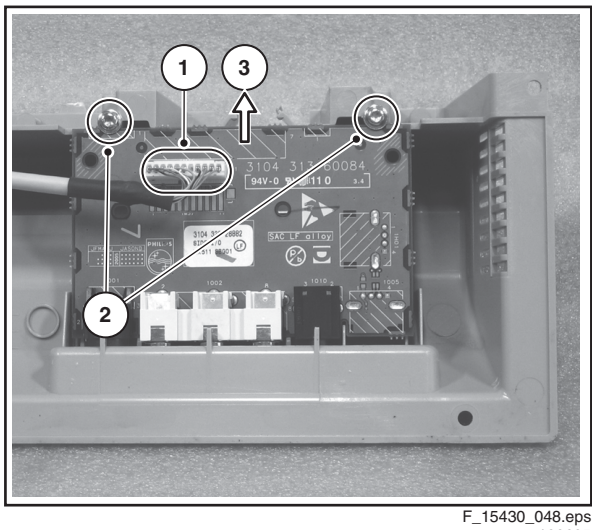

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Figure 4-7 Side I/O panel removal

When it is defective, replace the whole unit.

4.3.4 LED Panel

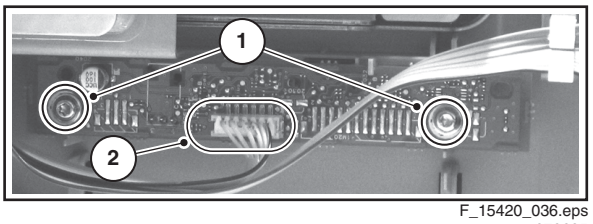

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Figure 4-8 LED panel

1. Remove the fixation screws (1) and take the panel out of its brackets.
2. Disconnect the cable (2) from the panel.

4.3.5 Keyboard Control Panel

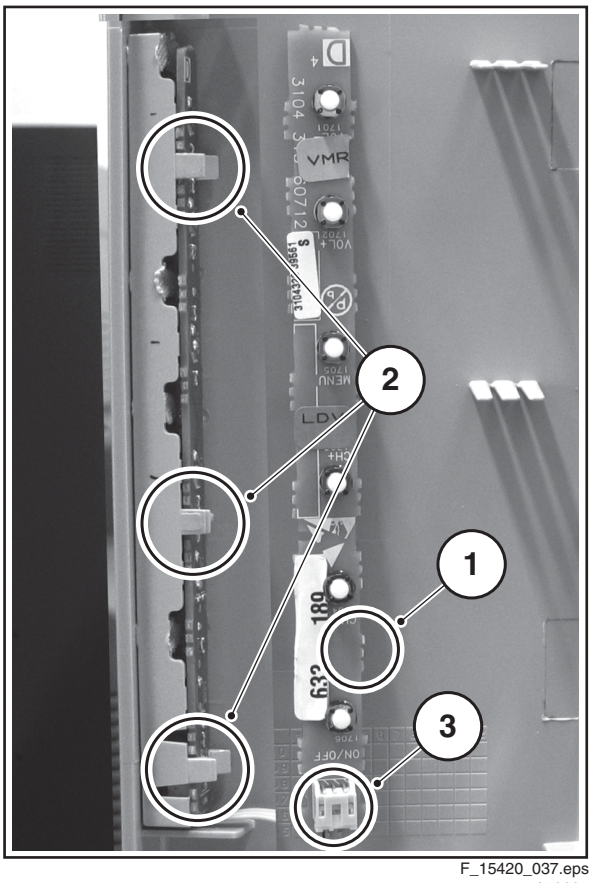

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Figure 4-9 Keyboard control panel

1. Remove the panel (1) from its three brackets (2).
2. Disconnect the cable (3) from the panel.

4.3.6 SSB Cover Shield

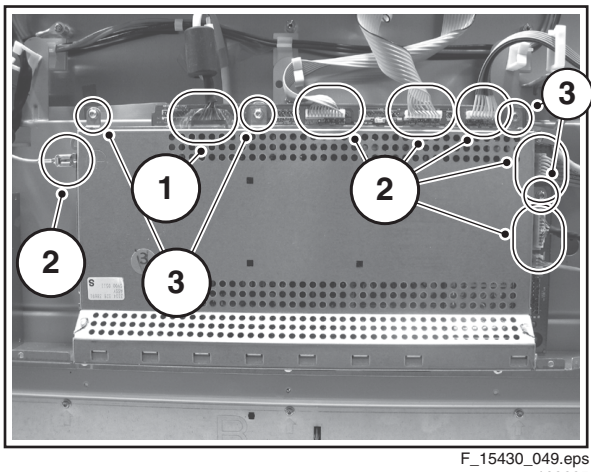

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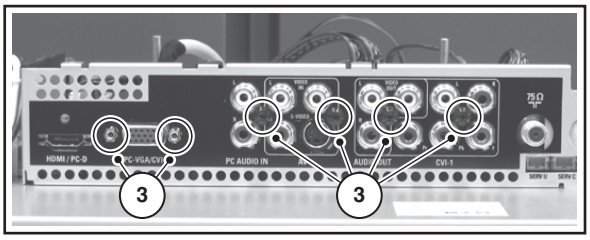
Figure 4-10 SSB cover shield

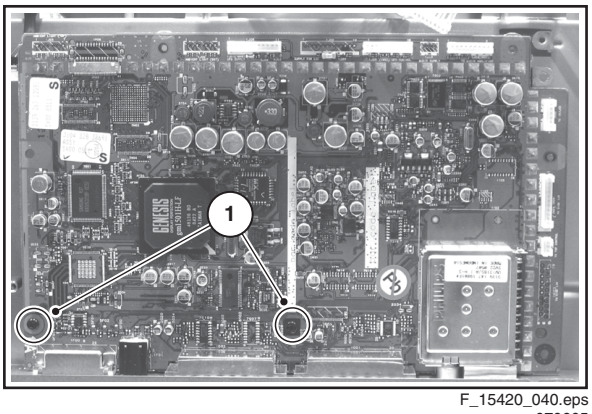


F_15270_075.eps
260505

Figure 4-11 DVI-I connector and rear I/O panel screws

1. Very **cautiously** disconnect the LVDS cable (1) from the SSB panel (see Figure “SSB board cover shield”). Notice that this cable is very fragile.
2. Remove all other cables (2) from the SSB board (see Figure “SSB board cover shield”), including the grounding cable.
3. Remove the fixation screws (3), see Figure “SSB board cover shield” and remove the SSB shield with the SSB board inside, and the rear I/O panel still attached to it.
4. Remove the fixation screws (1) from the DVI-I connector and from the rear panel, see Figure “DVI-I connector and rear panel screws”, and remove the rear I/O panel from the SSB board.
5. Remove the upper part of the shield from the SSB panel, by unhooking it from its brackets. Be careful not to damage the LVDS connector on the SSB board, see Figure “SSB board cover shield”.

4.3.7 SSB Board

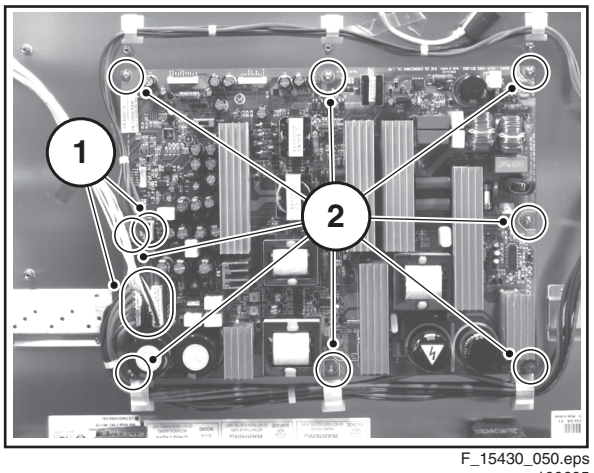


F_15420_040.eps
070605

Figure 4-12 SSB

1. Remove the two fixation screws (1) that secure the SSB board on the lower part of the SSB shielding, see Figure “SSB board”.
2. Remove the SSB panel.

4.3.8 Power Supply Panel

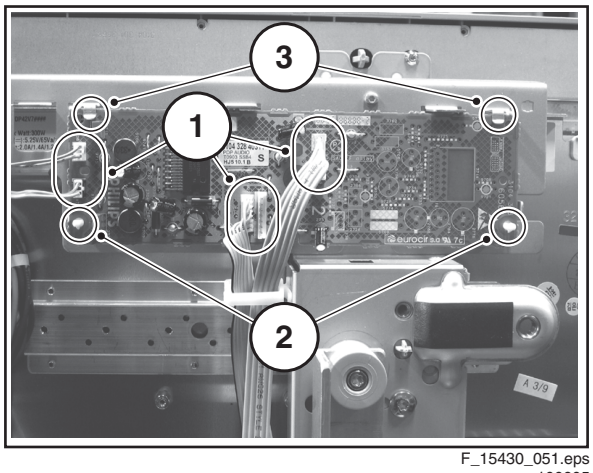


F_15430_050.eps
100605

Figure 4-13 Power supply panel

1. Disconnect all cables (1) from the panel.
2. Remove the fixation screws (2) from the panel.
3. Take the panel out of its brackets.

4.3.9 Class D Audio Amplifier Panel



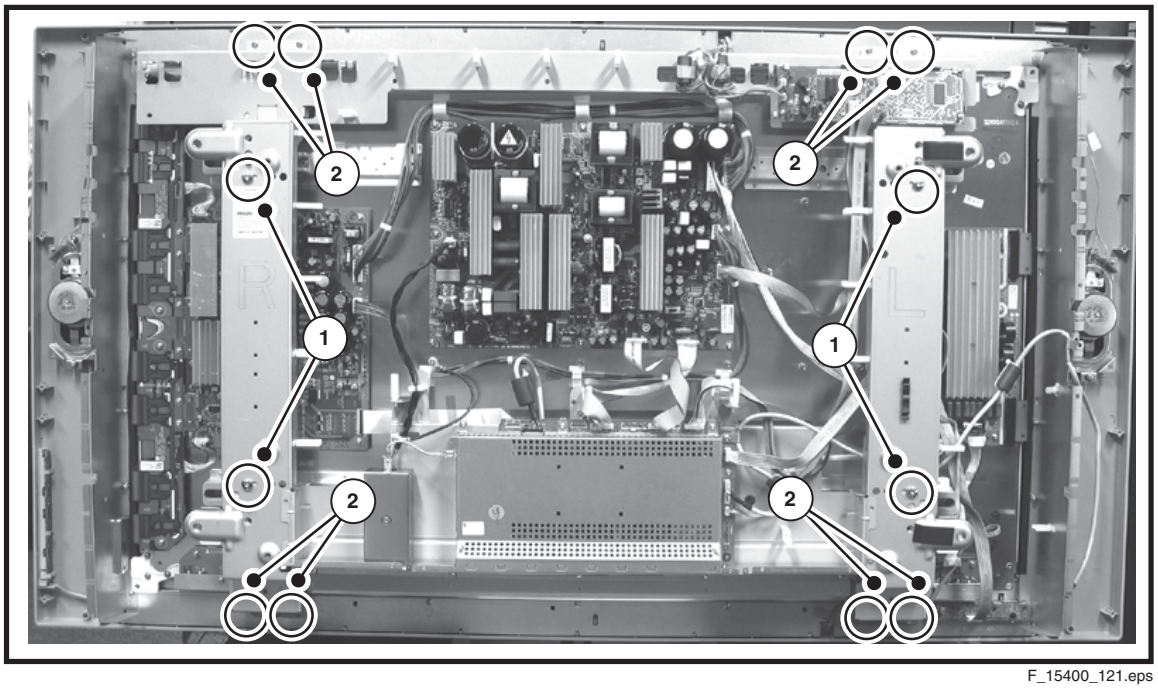
F_15430_051.eps
100605

Figure 4-14 Class D audio amplifier panel

1. Disconnect all cables (1) from the panel.
2. Pinch the plastic fixation clamps (2) firmly between your fingers, and pull the panel upwards.
3. Take the panel out of its brackets (3).

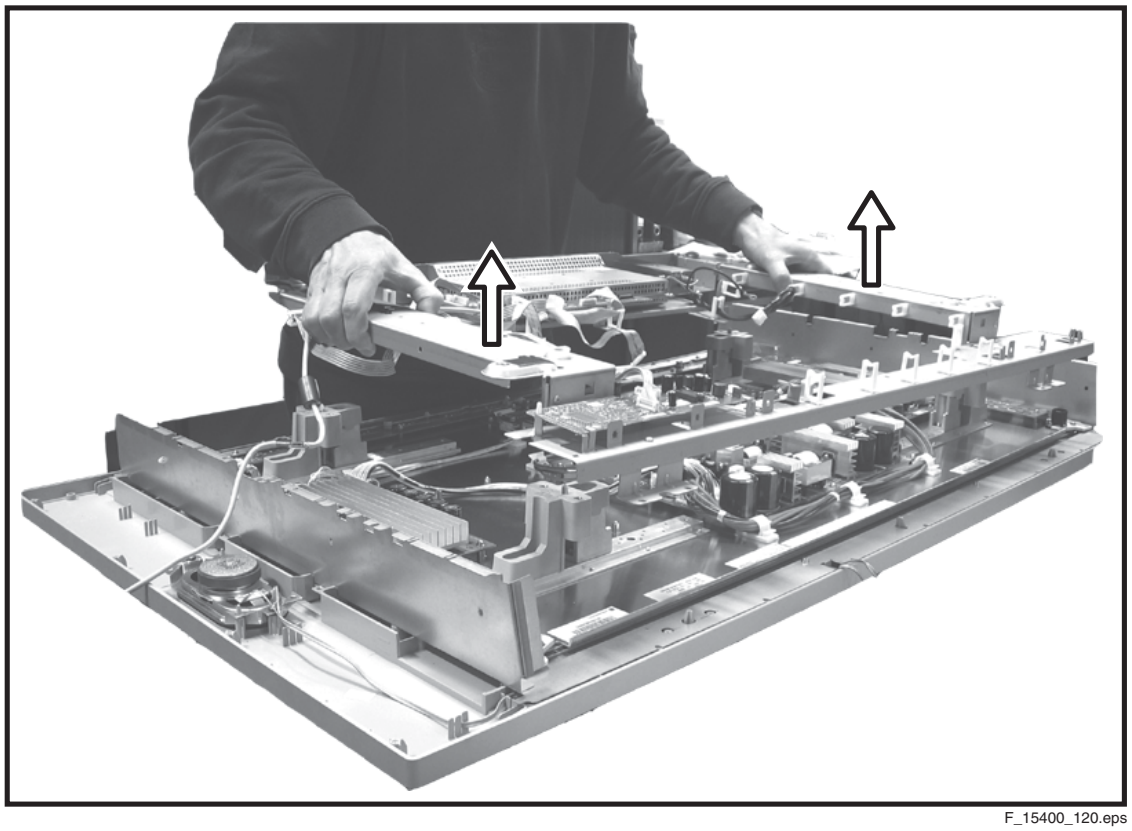
4.3.10 Plasma Display Panel / Glass Plate

1. Remove the T20 display panel mounting screws [1].
2. Remove the T10 screws [2] from the mounting frame.
3. Unplug all cable(s):
   - LVDS cable at SSB side (fragile connector!).
   - SSB supply cables at the Main Supply board.
   - Mains cable at the Main Supply board.
   - Side I/O cable at SSB side (fragile connector!).
   - Cable at LED panel.
   - Keyboard cable at SSB side.
   - Audio Amplifier supply cable at the Main Supply board.
   - Loudspeaker cables (incl. ferrites) at the Audio panel.
4. Lift the metal frame (together with all PWBs) from the display panel (see figure “Frame lift”).
5. After removal of the frame, lift the PDP from the set.



F_15400_121.eps
200505

Figure 4-15 Display panel removal

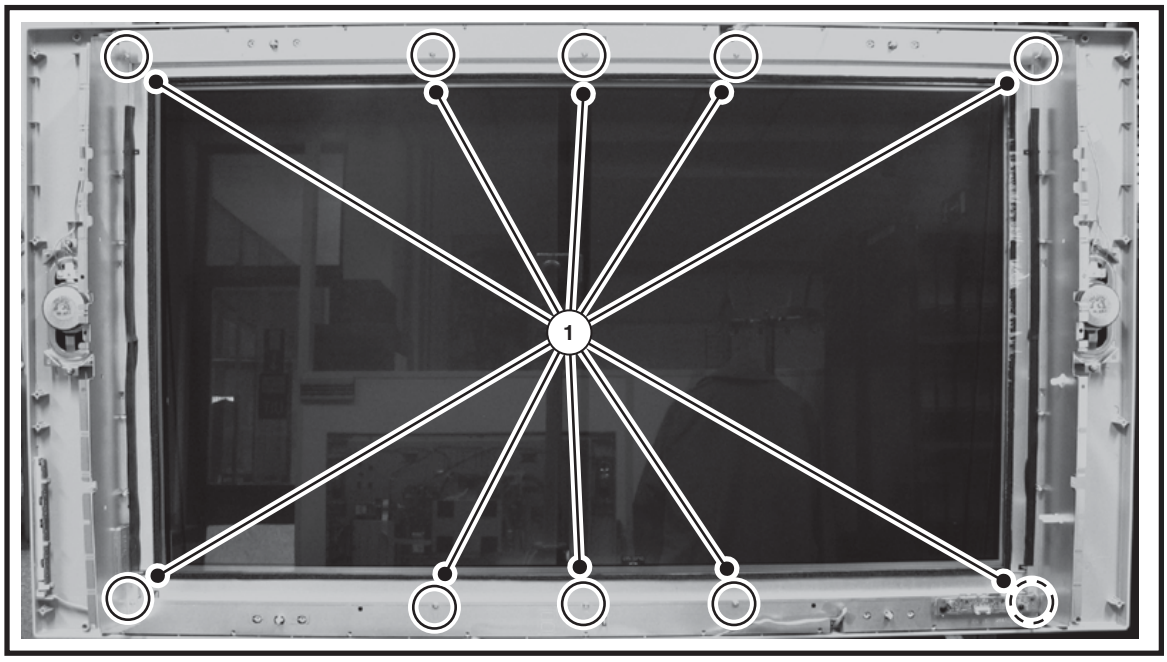


F_15400_120.eps
200505

Figure 4-16 Frame lift

4.3.11 PDP Glass Plate

In order to remove/exchange the PDP glass plate:
1. Remove the PDP as described earlier.
2. Remove the T10 screws [1] from the mounting frame.
3. After removal of the frame, you can lift the glass plate from the set.



F_15400_119.eps
200505

Figure 4-17 Glass plate removal

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:
- While re-assembling, make sure that all cables are placed and connected in their original positions. See Figure "Cable dressing". Be careful with the fragile LVDS cable.
- For a complete description of the Plasma panel, see the LGE plasma panel Service Manual (12nc is listed on the frontpage).

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Test Points

This chassis is equipped with test points in the service printing. In the schematics test points are identified with a rectangle box around Fxxx or Ixxx.
Perform measurements under the following conditions:

- Television set in Service Default Alignment Mode.
- Video input: Colour bar signal.
- Audio input: 3 kHz left channel, 1 kHz right channel.

5.2 Service Modes

Service Default mode (SDM) and Service Alignment Mode (SAM) offers several features for the service technician, while the Customer Service Mode (CSM) is used for communication between the call centre and the customer.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the possibilities of structured troubleshooting, error code reading, and software version readout for all chassis.
Minimum requirements for ComPair: a Pentium processor, a Windows OS, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a predefined setting for measurements to be made.
- To override software protections.
- To start the blinking LED procedure.
- To inspect the error buffer.
- To check the life timer.

Specifications

- Tuning frequency: 61.25 MHz.
- Colour system: NTSC.
- All picture settings at 50% (brightness, colour contrast, hue).
- Bass, treble, and balance at 50 %; volume at 25 %.
- All service-unfriendly modes (if present) are disabled. The service unfriendly modes are:
  - Timer / Sleep timer.
  - Child / parental lock.
  - Blue mute.
  - Hotel / hospital mode.
  - Auto shut off (when no “IDENT” video signal is received for 15 minutes).
  - Skipping of non-favourite presets / channels.
  - Auto-storage of personal presets.
  - Auto user menu time-out.
  - Auto Volume Levelling (AVL).

How to Enter

To enter SDM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: “**062596**” directly followed by the MENU button (do not allow the display to time out between entries while keying the sequence).
- Short "Service" jumpers on the TV board during cold start and apply mains (see Figure "Service jumpers"). Then press the mains button (remove the short after start-up). **Caution**: Entering SDM by shorting "Service" jumpers will override the +8V-protection. Do this only for a short period. When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.
- Or via ComPair.

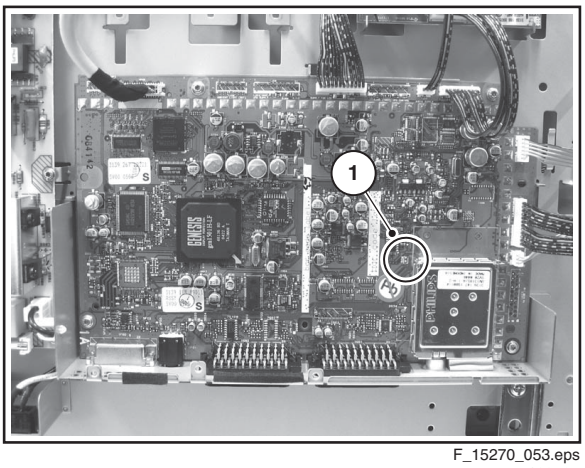


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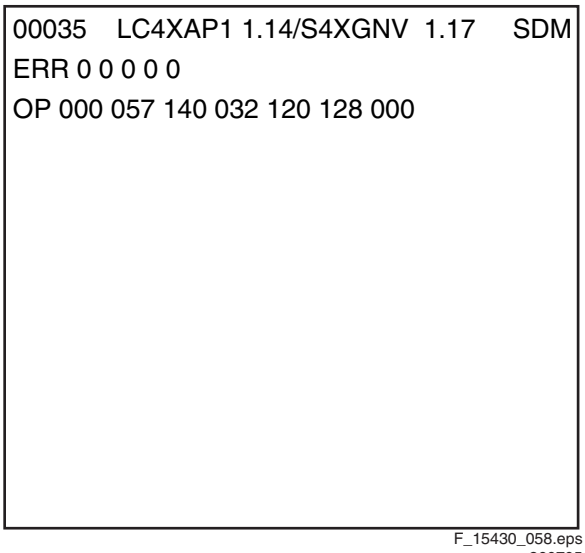
Figure 5-1 Service jumpers

After entering SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode.



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260705

Figure 5-2 SDM menu

How to Navigate

Use one of the following methods:

- When you press the MENU button on the remote control, the set will switch on the normal user menu in the SDM mode.
- On the TV, press and hold the VOLUME DOWN and press the CHANNEL DOWN for a few seconds, to switch from SDM to SAM and reverse.

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set off by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

Specifications

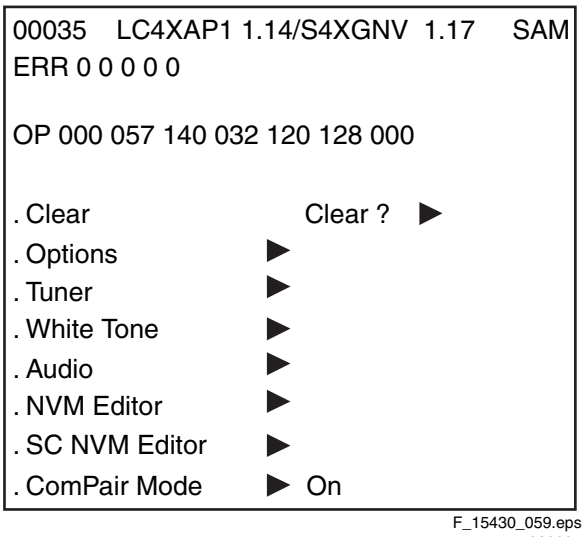
- Operation hours counter (maximum five digits displayed).
- Software version, Error codes, and Option settings display.
- Error buffer clearing.
- Option settings.
- AKB switching.
- Software alignments (Tuner, White Tone, Geometry & Audio).
- NVM Editor.
- ComPair Mode switching.

How to Enter

To enter SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "**062596**" directly followed by the OSD/ STATUS/INFO(I+) button (do not allow the display to time out between entries while keying the sequence).
- Or via ComPair.

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.



F_15430_059.eps
080605

Figure 5-3 SAM menu

Menu Explanation

1. **LLLLL.** This represents the run timer. The run timer counts normal operation hours, but does not count standby hours.
2. **AAABCD-X.Y.** This is the software identification of the main microprocessor:
   - **A**= the project name (LC04.x).
   - **B**= the region: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM.
   - **C**= the software diversity:
     - **Europe:** T= 1 page TXT, F= Full TXT, V= Voice control.
     - **LATAM and NAFTA:** N= Stereo non-dBx, S= Stereo dBx.
     - **Asian Pacific:** T= TXT, N= non-TXT, C= NTSC.
     - **ALL regions:** M= mono, D= DVD, Q= Mk2.
   - **D**= the language cluster number.
   - **X**= the main software version number (updated with a major change that is incompatible with previous versions).
   - **Y**= the sub software version number (updated with a minor change that is compatible with previous versions).
3. **EEEEE-F.GG.** This is the software identification of the Scaler:
   - **EEEEEE**= the scaler sw cluster
   - **F**= the main sw version no.
   - **GG**= the sub-version no.
4. **SAM.** Indication of the Service Alignment Mode.
5. **Error Buffer.** Shows all errors detected since the last time the buffer was erased. Five errors possible.
6. **Option Bytes.** Used to set the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
7. **Clear.** Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
8. **Options.** Used to set the option bits. See "Options" in the Alignments section for a detailed description.
9. **Tuner.** Used to align the tuner. See "Tuner" in the Alignments section for a detailed description.
10. **White Tone.** Used to align the white tone. See "White Tone" in the Alignments section for a detailed description.
11. **Audio.** No audio alignment is necessary for this television set.
12. **NVM Editor.** Can be used to change the NVM data in the television set. See table "NVM data" further on.
13. **SC NVM Editor.** Can be used to edit Scaler NVM.
14. **ComPalr.** Can be used to switch on the television to In System Programming (ISP) mode, for software uploading via ComPair.
    Caution: When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.

How to Navigate

- In SAM, select menu items with the MENU UP/DOWN keys on the remote control transmitter. The selected item will be highlighted. When not all menu items fit on the screen, use the MENU UP/DOWN keys to display the next / previous menu items.
- With the MENU LEFT/RIGHT keys, it is possible to:
  - Activate the selected menu item.
  - Change the value of the selected menu item.
  - Activate the selected submenu.
- In SAM, when you press the MENU button twice, the set will switch to the normal user menus (with the SAM mode still active in the background). To return to the SAM menu press the MENU or STATUS/EXIT button.
- When you press the MENU key in while in a submenu, you will return to the previous menu.

How to Store SAM Settings
To store the settings changed in SAM mode, leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

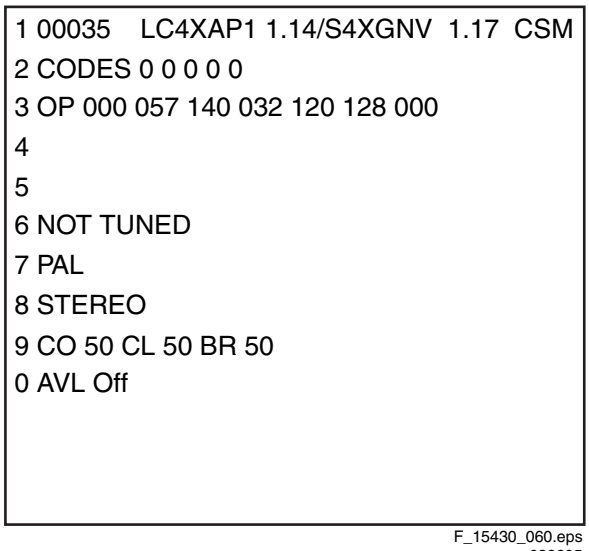
How to Exit
Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set “off” by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SAM when mains is re-applied, and the error buffer is not cleared.

5.2.3 Customer Service Mode (CSM)

Purpose
The Customer Service Mode shows error codes and information on the TV’s operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.
The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to Enter
To enter CSM, press the following key sequence on the remote control transmitter: “**123654**” (do not allow the display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:



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080605

Figure 5-4 CSM menu

Menu Explanation
1. Indication of the decimal value of the operation hours counter, Software identification of the main microprocessor (see "Service Default or Alignment Mode" for an explanation), and the service mode (CSM = Customer Service Mode).
2. Displays the last five errors detected in the error code buffer.
3. Displays the option bytes.
4. Displays the type number version of the set.
5. Reserved item for P3C call centres (AKBS stands for Advanced Knowledge Base System).
6. Indicates the television is receiving an "IDENT" signal on the selected source. If no "IDENT" signal is detected, the display will read "NOT TUNED"
7. Displays the detected Colour system (e.g. PAL/NTSC).
8. Displays the detected Audio (e.g. stereo/mono).
9. Displays the picture setting information.
10. Displays the sound setting information.

How to Exit
To exit CSM, use one of the following methods:
- Press the MENU, STATUS/EXIT, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Problems and Solving Tips Related to CSM

5.3.1 Picture Problems

Note: The problems described below are all related to the TV settings. The procedures used to change the value (or status) of the different settings are described.

Picture too Dark or too Bright

If:
- The picture improves when you press the AUTO PICTURE button on the remote control transmitter, or
- The picture improves when you enter the Customer Service Mode,

Then:
1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys (if necessary) to select BRIGHTNESS.
6. Press the MENU LEFT/RIGHT keys to increase or decrease the BRIGHTNESS value.
7. Use the MENU UP/DOWN keys to select PICTURE.
8. Press the MENU LEFT/RIGHT keys to increase or decrease the PICTURE value.
9. Press the MENU button on the remote control transmitter twice to exit the user menu.
10. The new PERSONAL preference values are automatically stored.

White Line around Picture Elements and Text

If:
The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:
1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select SHARPNESS.
6. Press the MENU LEFT key to decrease the SHARPNESS value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Snowy Picture

Check CSM line 6. If this line reads “Not Tuned”, check the following:

- Antenna not connected. Connect the antenna.
- No antenna signal or bad antenna signal. Connect a proper antenna signal.
- The tuner is faulty (in this case line 2, the Error Buffer line, will contain error number 10). Check the tuner and replace/ repair the tuner if necessary.

Black and White Picture

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select COLOR.
6. Press the MENU RIGHT key to increase the COLOR value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Menu Text not Sharp Enough

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select PICTURE.
6. Press the MENU LEFT key to decrease the PICTURE value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

5.4 Service Tools

5.4.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (service remote control), which allows faster and more accurate diagnostics. ComPair has three big advantages:

1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
2. ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial (or RS-232) cable.
For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector(s).

The ComPair faultfinding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in two ways:

- Automatically (by communicating with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I^2C/UART level. ComPair can access the I^2C/UART bus of the television. ComPair can send and receive I^2C/UART commands to the microcontroller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I^2C/UART buses of the TV-set.
- Manually (by asking questions to you): Automatic diagnosis is only possible if the microcontroller of the television is working correctly and only to a certain extent. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions *(e.g. Does the screen give a picture? Click on the correct answer: YES / NO)* and showing you examples *(e.g. Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope)*. You can answer by clicking on a link *(e.g. text or a waveform picture)* that will bring you to the next step in the faultfinding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

How to Connect

This is described in the chassis faultfinding database in ComPair.

Caution: It is compulsory to connect the TV to the PC as shown in the picture below (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

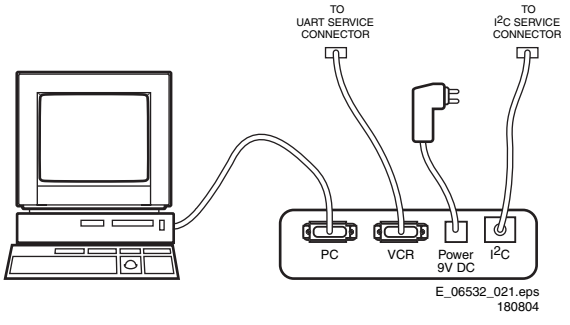


Figure 5-5 ComPair interface connection

How to Order

- ComPair order codes (EU/AP/LATAM):
- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excl. transformer): 4822 727 21631.
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (update): 3122 785 60070 (year 2002), 3122 785 60110 (year 2003 onwards).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003), 3122 785 60130 (year 2004).
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer (non-UK): 4822 727 21632.
- Transformer (UK): 4822 727 21633.
- ComPair interface cable: 3122 785 90004.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

Note: If you encounter any problems, contact your local support desk.

5.4.2 LVDS Tool

Introduction

This service tool (also called “ComPair Assistant 1“) may help you to identify, in case the TV does not show any picture, whether the Small Signal Board (SSB) **or** the display of a Flat TV is defective.
Furthermore it is possible to program EPLDs with this tool (Byteblaster). Read the user manual for an explanation of this feature.

Since 2004, the LVDS output connectors in our Flat TV models are standardised (with some exceptions). With the two delivered LVDS interface cables (31p and 20p) you can cover most chassis (in special cases, an extra cable will be offered).

When operating, the tool will show a small (scaled) picture on a VGA monitor. Due to a limited memory capacity, it is not possible to increase the size when processing high-resolution LVDS signals (>= 1280x768). Generally this tool is intended to determine if the SSB is working or not. Thus to determine if LVDS, RGB, and sync signals are okay.

How to Connect

Connections are explained in the user manual, which is delivered with the tool.

Note: To use the LVDS tool, you must have ComPair release 2004-1 (or later) on your PC (engine version >= 2.2.05).
For every TV type number and screen size, one must choose the proper settings via ComPair. The ComPair file will be updated regularly with new introduced chassis information.

How to Order

- LVDS tool (incl. two LVDS cables: 31p and 20p): 3122 785 90671.
- Service Manual LVDS tool: 3122 785 00810.
- LVDS cable 20p (for Telra 14-inch): 3122 785 90810.
- LVDS cable 30p (for LC4.3): 3122 785 90820.
- LVDS cable 41p-to-31p for CA1 (dual -> single LVDS): 3122 785 90830.

5.5 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

You can read the error buffer in 3 ways:

- On screen via the SAM (if you have a picture).
  Examples:
  - ERROR: 0 0 0 0 0 : No errors detected
  - ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
  - ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See “The Blinking LED Procedure”.
- Via ComPair.

5.5.2 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:
  - To enter SAM, press the following key sequence on the remote control transmitter: “**062596**” directly followed by the OSD/STATUS button (do not allow the display to time out between entries while keying the sequence).
  - Make sure the menu item CLEAR is highlighted. Use the MENU UP/DOWN buttons, if necessary.
  - Press the MENU RIGHT button to clear the error buffer. The text on the right side of the “CLEAR” line will change from “CLEAR?” to “CLEARED”
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.5.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-1 Error code overview

Error	Device	Error Description	Check Item	Diagram
0	Not applicable	No Error		
1	Not applicable	Mis-match of TV Hercules SW and Scaler SW	-	-
2	Not applicable	-	-	-
3	Not applicable	-	-	-
4	Genesis Scaler Flash-ROM	I^2C error while communicating with the Genesis Scaler and/or Flash-ROM is faulty/empty	7801 7B01	B7 + B8 B10
5	Scaler supply 7752	+5V protection	7752	B6
6	Not applicable	General I^2C error	1102, 7L04, 7M00	B1 + B18 + B19
7	ADC	I^2C error	7L04	B18
8	Scaler EEPROM	I^2C error while communicating with the Scaler EEPROM	7C01	B11
9	Hercules EEPROM	I^2C error while communicating with the Hercules EEPROM (NVM for TV). **Remark:** when the Hercules EEPROM is defective, the Hercules should operate with its default values.	7207	B2
10	Tuner	I^2C error while communicating with the PLL tuner	1102, F102, F104, F107	B1
11	Columbus	I^2C error while communicating with the 2D/3D combfilter Columbus	7M00	B19
12	Not applicable	-	-	-
13	HDMI Panellink Receiver/ Decoder	I^2C error while communicating with the iBoard HDMI Panellink Receiver/ Decoder (only in NAFTA and AP sets)	7D03	B12 (only in NAFTA and AP sets)
14	Scaler SDRAM	Read-write error with the Scaler SDRAM	7B01	B10
15	Not applicable	-	-	-
16	EPLD	I^2C error while communicating with EPLD	7N02	B20 + B21
17	Digital Module (only on Digital sets)	I^2C error while communicating with the Digital Module (only on Digital sets)	Digital Module (only on Digital sets)	
18	Not applicable	-	-	-

5.6 The Blinking LED Procedure

Using this procedure, you can make the contents of the error buffer visible via the front LED. This is especially useful when there is no picture.

When the SDM is entered, the front LED will blink the contents of the error-buffer:
- The LED blinks with as many pulses as the error code number, followed by a time period of 1.5 seconds, in which the LED is off.
- Then this sequence is repeated.

Any RC5 command terminates this sequence.

Example of error buffer: **12 9 6 0 0**
After entering SDM, the following occurs:
- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

5.7 Fault Finding and Repair Tips

Notes:
- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be handy if one directly can change the NVM contents. This can be done with the “NVM Editor” in SAM mode. With this option, single bytes can be changed.

Caution:
- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orgininal settings, if the new settings turn out to be incorrect.

Table 5-2 NVM editor overview

	Hex	Dec	Description
.ADR	0x000A	10	Existing value
.VAL	0x0000	0	New value
.Store	Store?		

Table 5-3 NVM Default values (option bit settings through NVM Editor in SAM Mode)

Byte Nr.	Bit	Feature/Mode	Description	50PF7320/79 /93 /98	42PF7320/79 /93 /98
Byte 0 174(dec)	0	QSS (LSB)	Mode of quasi split sound amplifier	1	1
	1	FMI	Connection of output of QSS amplifier	1	1
	2	HCO	EHT tracking mode	0	0
	3	HP2	Synchronization of OSD/Text display	1	1
	4	FSL	Forced slicing level for vertical sync	1	1
	5	TFR	DC transfer ratio of luminance signal	1	1
	6	OSVE	Black current measuring in overscan	0	0
	7	MVK (MSB)	(For Future Usage, as defined by software)	0	0
		Total Dec Values		59	59
		Total Hex Values		3B	3B
Byte 1 175(dec)	0	PSE	PSE	0	0
	1	OPC	OPC	0	0
	2	PRIS	PRIS	0	0
	3	CONTINUOUS FACTORY	Continuous factory mode	0	0
	4	WHITE PATTERN ON	Last color pattern status in factory mode	0	0
	5	SDM MODE	Service default mode on/off	0	0
	6	SAM MODE	Service Align mode on/off	0	0
	7	SVMA	Scavm On / Off	0	0
		Total Dec Values		0	0
		Total Hex Values		00	00
Byte 2 176(dec)	0	MUTE STATUS	Mute status	0	0
	1	TUNER AUTO MODE	Auto mode	1	1
	2	CABLE MODE	Cable/Antenna mode	0	0
	3	LAST POWER MODE	Last power status of the set	1	1
	4	CHILD LOCK MODE	Child lock enabled	0	0
	5	SURF MODE	Surf mode on/off	0	0
	6	FACTORY MODE	Factory mode on	0	0
	7	PSNS	For PAL color enhancement in ES4	1	1
		Total Dec Values		138	138
		Total Hex Values		8A	8A
Byte 3 177(dec)	0	RADIO/TV MODE	Radio mode or TV mode	0	0
	1	WAKE-UP MODE	WAKE-UP MODE	0	0
	2	HOTEL MODE	TV in Hotel mode	0	0
	3	HOTEL KBD LOCK	Keyboard locked	0	0
	4	HBL	HBL	0	0
	5	BLS	Blue stretch mode	1	1
	6	SL	SL	0	0
	7	CFA0	Comb filter On/Off	1	1
		Total Dec Values		160	160
		Total Hex Values		A0	A0
Byte 4 178(dec)	0	Signal Strength	Signal Strength Switch in MK2	0	0
	1	LPG	LPG	0	0
	2	DVD TRAY LOCK	Lock/Unlock DVD tray	0	0
	3	SCRSAVER MODE	Screen saver mode	1	1
	4	BKS	Black Stretch Mode	1	1
	5	BSD	Black Stretch Depth	1	1
	6	CRA0	Coring on SVM	1	1
	7	PIP QSS	PIP QSS	0	0
		Total Dec Values		120	120
		Total Hex Values		78	78

Byte Nr.	Bit	Feature/Mode	Description	50PF7320/79 /93 /98	42PF7320/79 /93 /98
Byte 5 179(dec)	0	FFI	Fast Filter	0	0
	1	NNR	No red reduction during blue stretch	1	1
	2	MUS	NTSC matrix	1	1
	3	GAM	Gamma control	1	1
	4	CBS	Control sequence of beam current limiting	0	0
	5	LLB	Low level of beam current limiter	0	0
	6	DSA	Dynamic skin tone angle area	1	1
	7	DSK	Dynamic skin tone angle on/ off	0	0
		Total Dec Values		78	78
		Total Hex Values		4E	4E
Byte 6 180(dec)	0	LTI status	LTI last status	1	1
	1	Inc_Life_Time	Inc_Life_Time	0	0
	2	PC_Mode	PC_Mode	0	0
	3	HD_Mode	HD_Mode	0	0
	4	Tact_Switch	Tact_Switch	0	0
	5	Set_In_Special_Stby	Set_In_Special_Stby	0	0
	6	Hotel_OSDDisplay	Hotel_OSDDisplay	0	0
	7	Hotel_MonitorOut	Hotel_MonitorOut	0	0
		Total Dec Values		1	1
		Total Hex Values		01	01
Byte 7 181(dec)	0	Hotel_IconMode	Hotel_IconMode	0	0
	1	DBE	DBE	1	1
	2	SD	SD	0	0
	3	Set_in_PC_Sleep_Mode	Set_in_PC_Sleep_Mode	0	0
	4	Reserved	Reserved	0	0
	5	Reserved	Reserved	0	0
	6	Reserved	Reserved	0	0
	7	Reserved	Reserved	0	0
		Total Dec Values		2	2
		Total Hex Values		02	02

5.7.2 Load Default NVM Values

In case a blank NVM is placed or when the NVM content is corrupted, default values can be downloaded into the NVM. (For empty NVM replacement, short the SDM with a jumper and apply the mains voltage. Remember to remove the jumper after the reload is completed). After the default values are downloaded, it will be possible to start up and to start aligning the TV set. This is no longer initiated automatically; to initiate the download the following action has to be performed:

1. Switch “off” the TV set by disconnecting the AC Power plug.
2. Short circuit the SDM jumpers (keep short-circuited).
3. Press P+ or Ch+ on the local keyboard (and keep it pressed).
4. Switch on the TV set via the AC Power plug.
5. Keep pressing the P+/Ch+ button until the set has started up and the SDM is shown.

Alternative method:

1. Go to SAM.
2. Select NVM Editor (not SC NVM Editor).
3. Select ADR (address) to 1 (dec).
4. Change the VAL (value) to 170 (dec).
5. Store the value.
6. Disconnect the mains plug and wait for a few seconds.
7. Reconnect the mains plug and wait until the set goes into its standby mode (red LED lights up).
8. Restart the set.

5.7.3 Tuner and IF

No Picture in RF Mode, but there is a Noise Raster

1. Check whether picture is present in AV. If not, go to Video processing troubleshooting section.
2. If present, check if the Option settings are correct.
3. Check if all the supply voltages are present (3.3/5/8/12/33 V).
4. Check if the I^2C lines are working correctly (3.3 V).
5. Manually store a known channel and check if there is IF output at Tuner pin 11.
6. Check the tuning DC voltage at pin 2 of the Tuner. The DC voltage should vary according to the frequency/channel being chosen.
7. If the tuning voltage is OK, check the tuner output, pin 11.
8. If it has no output, the Tuner may have a defect. Change the Tuner.

Sound in Picture Problem for L' System (rolling horizontal lines)

1. Check whether AGC L' in SAM mode is set to 0.
2. If yes, align the set to correct value.

Required System is not Selected Correctly

Check whether a Service jumper (#4204 & 4205, 0805 size) is present. If yes, remove it.

5.7.4 Video Processing

No Power

1. Check +12 V and 3V3 at position 1J02.
2. If no supply, check the connector 1J02.
3. If it is correct, check the power supply board.

Power Supply is Correct, but no Green LED

1. Check if the connectors 1K00 are properly inserted.
2. If they are inserted correctly, check if the 3V3 is present.

No Picture Display (blank screen with correct sound output)

1. Check whether the user menu is visible.
2. If the user menu is OK, activate teletext mode.
3. If teletext is OK, the problem is in the ADC (B18) & Columbus 3D combfilter (B19), if present (depending on model, see also paragraph “Teletext Path” in chapter 9).
4. If the user menu is not visible, check if the LCD panel backlight is ON.
5. If the backlight is OFF, the problem is in the power supply board or LCD panel. Also check pin 12 (LAMP_ON_OFF) of 1J02. It should be HIGH during normal operation.

Note: For faultfinding purposes, it is important to know the following: in Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video path (Hercules output), whereas the analogue RGB input (analogue input of the scaler) is only used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. If there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty. In Crystal Clear models, which do not have an ADC and Columbus, the RGB path (analogue input of scaler) is used for both video and teletext.

No TV, but PC is Present

1. Check if Hsync_SDTV and Vsync_SDTV are present at pin 1 & pin13 of 7E03.
2. If they are present, check teletext output.
3. If there is no teletext output, the IC TDA150xx may be defect.

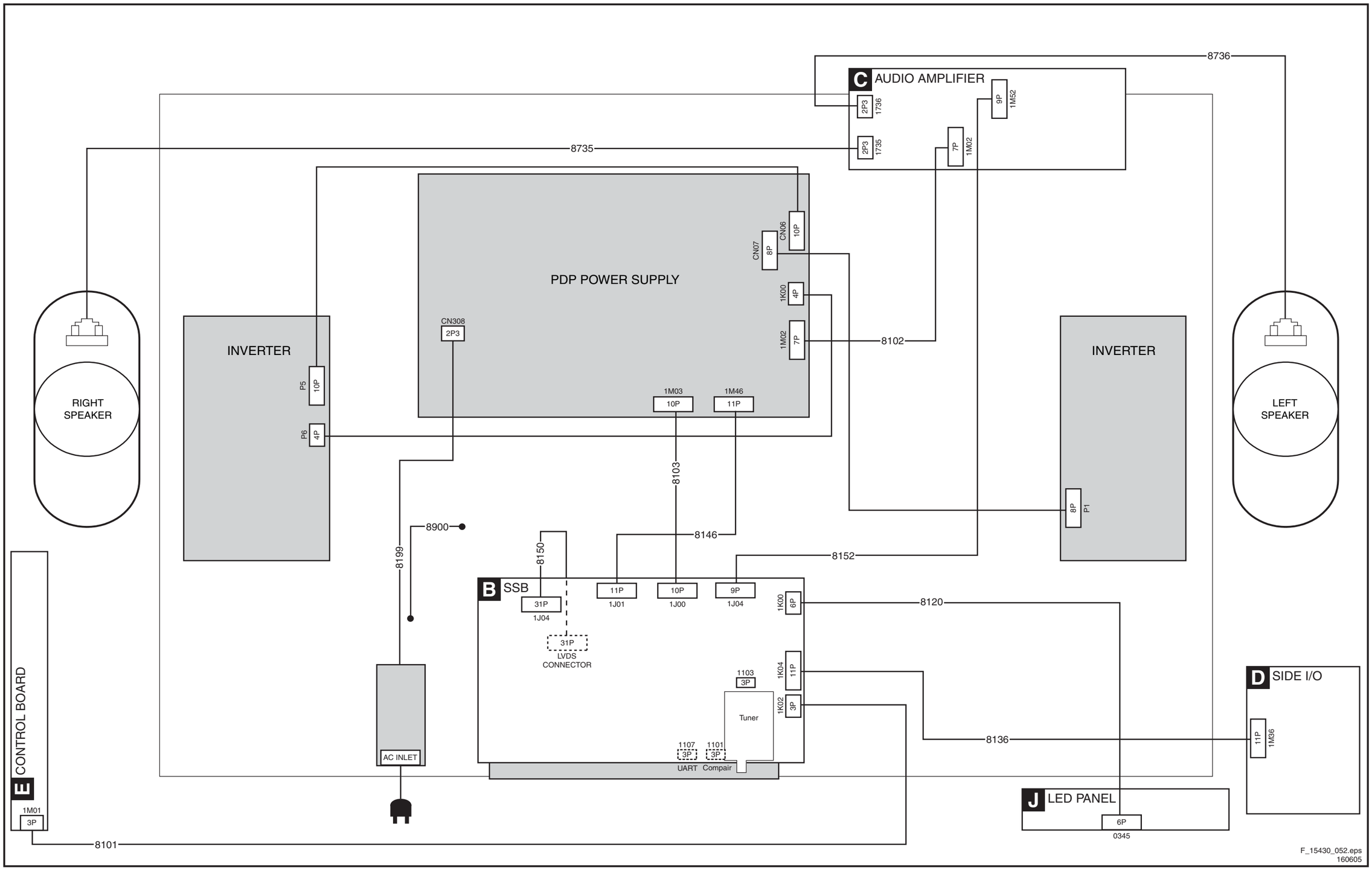
5.7.5 Power Supply

In case the power supply does not work, check (apart from the obvious fuse-check) if the oscillators in IC7001 (in TV sets with 37 inch screens) or in IC7001 and IC7U01 (in TV sets with 42 inch screens) are working. If not, replace the ICs.

6. Block Diagrams, Testpoint Overviews, and Waveforms

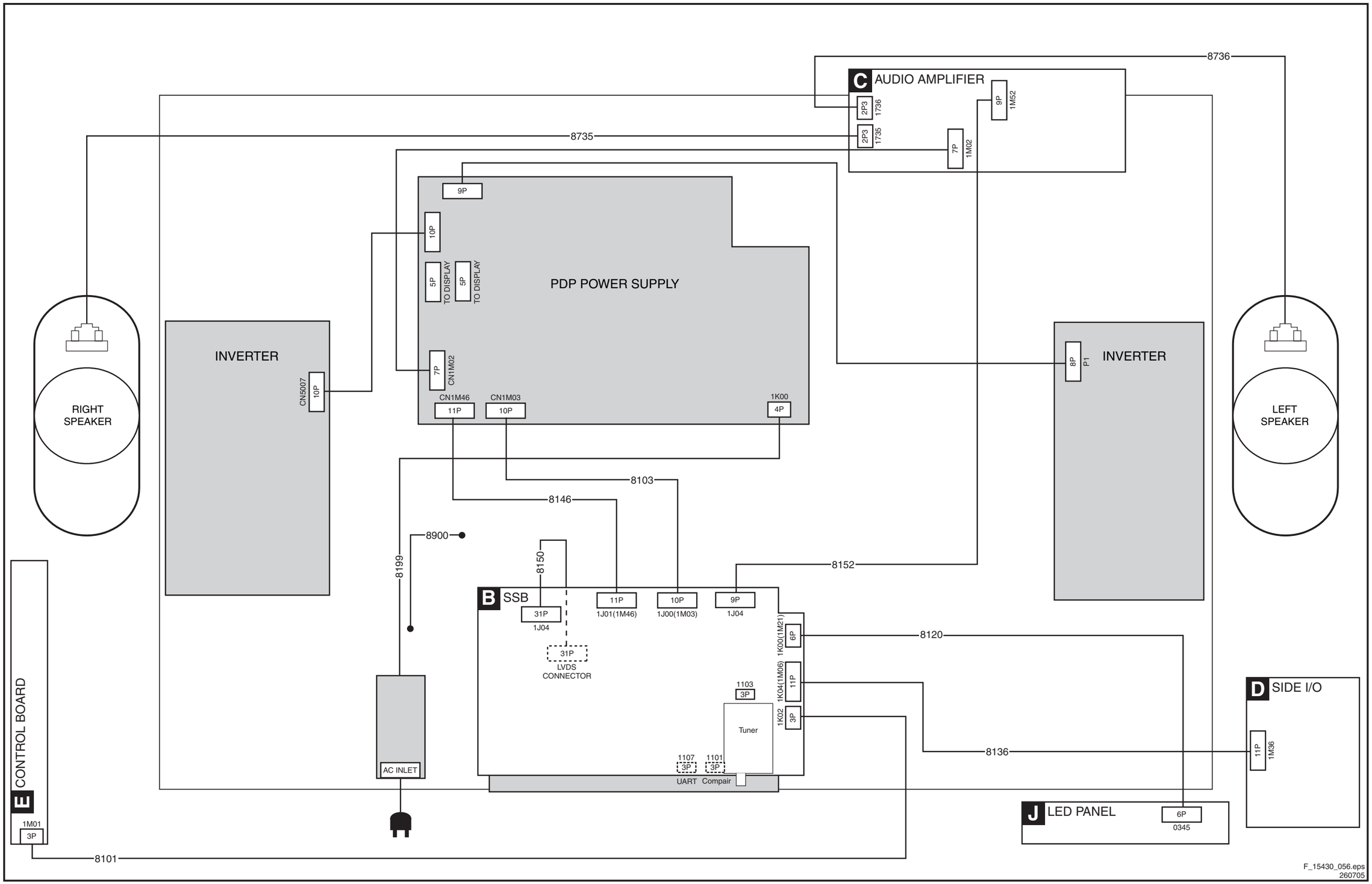
Wiring Diagram 42 Inch

WIRING 42”

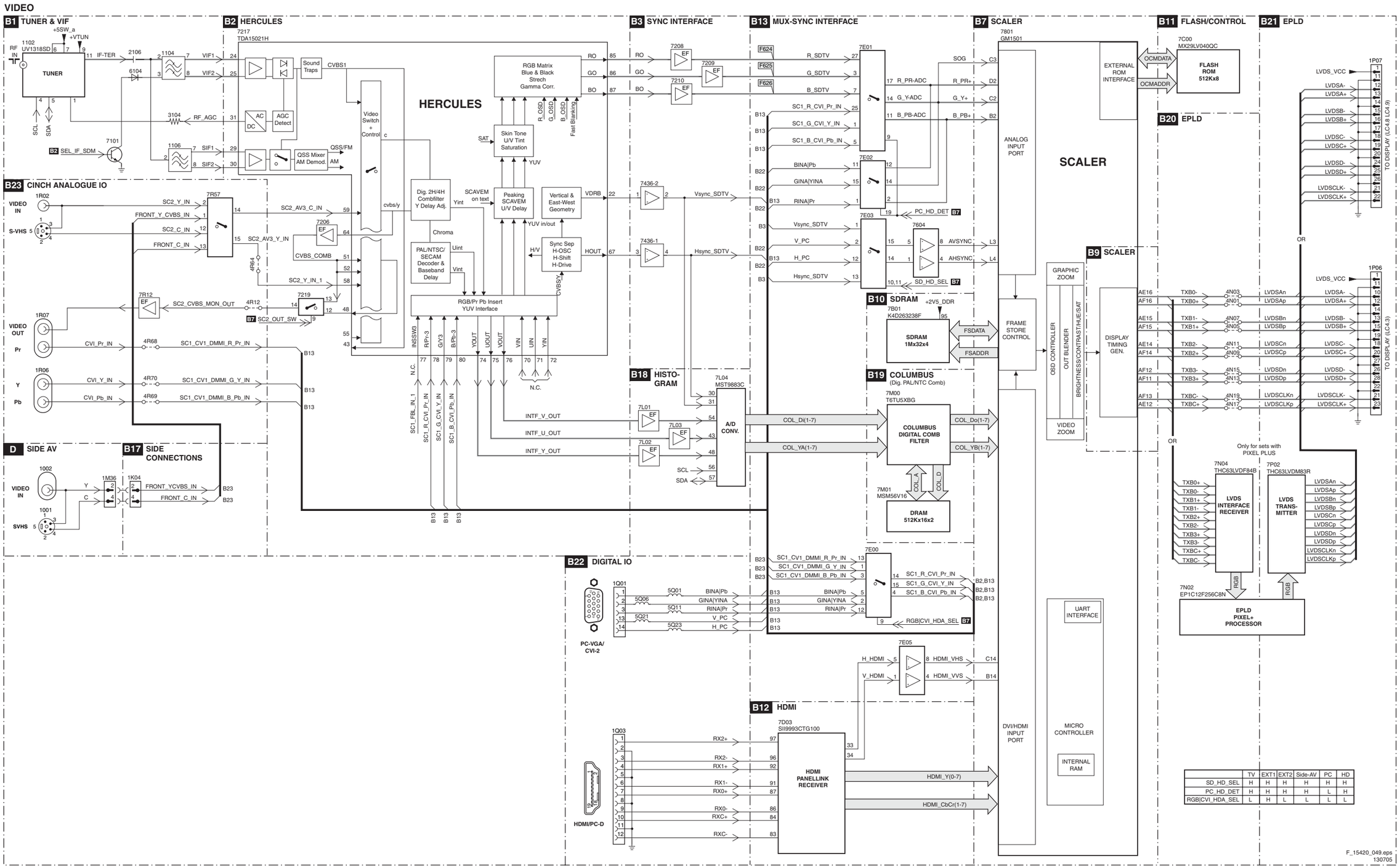


Wiring Diagram 50 Inch

WIRING 50”



Block Diagram Video



	TV	EXT1	EXT2	Side-AV	PC	HD
SD_HD_SEL	H	H	H	H	H	H
PC_HD_DET	H	H	H	H	L	H
RGB|CVI_HDA_SEL	L	H	L	L	L	L

Block Diagram Audio

AUDIO

B1 TUNER & IF

1102 UV1316E/A I H-4
RF IN
RF OUT
Only on DVB Sets
TUNER
IFOUT 11
F108 IF-TER
2106
4110
1106
SIF1
SIF2
6104
7101
B2 SEL_IF_SDM
SCL
SDA

B2 HERCULES

7217 TDA15021H
QSS Mixer AM Demod.
AM
QSS/FM
AD Conv. Std Stereo Decoder
AUDIO CONTROL Vol/Treb/ Bass Features DACs
AUDIO SELECT ADC/DAC
I2S Processor
4212 AUDOUTLSL
4211 AUDOUTLSR

B5 AUDIO PROCESSING

4618 AUDIO-L
4219 AUDIO-R
SOUND-ENABLE_1
POR_AUDIO
B5
7601 TS482ID
OUT_MUTE
7606 MUTE
7602 74HC08PW
SOUND_ENABLE B2
POWER_DOWN B16
EXT_MUTE B2
OUT_MUTE
POR_AUDIO
B16
3628 +5V
3629

B16

1J04 (1M52)
N.C.

SA3 AUDIO

1739
AUDIO-L
AUDIO-R
SOUND-ENABLE
POR-CLASSD
PROT_AUDIOSUPPLY
7700 TDA7490
+16V+19V
4,22
PWM
stby-mute
OSC
2,24
-16V-19V
7701:7707 SOUND ENABLE
PROT1
DCPROT
7709/7710 AUDIO SUPPLY PROT. CIRCUIT
6703 3764 -16 V-19V
6702 3761 +16 V+19V
+16 V+19V
-16 V-19V
5701 3718
5702 3717
5731 5730
1736 1735
Speaker L 15W/8Ω
Speaker R 15W/8Ω
1M02
TO 1002 SA SUPPLY

B17 SIDE CONNECTORS

HP_LOUT
HP_ROUT
N.C.
1K04 1M36

D SIDE I/O

SOUND L-HEADPHONE-OUT
SOUND R-HEADPHONE-OUT
DETECT
1010
HEADPHONE

B23 CINCH ANALOGUE

1R06
CVI-1 AUDIO IN L/R
SC1_COMP_AV1_L_IN
SC1_COMP_AV1_R_IN
1R03
AV AUDIO IN L/R
SC2_L_IN
SC2_R_IN
PC AUDIO IN L/R
AV3_L
AV3_R
3Q30 AV3_LEFT
3Q31 AV3_RIGHT

B22 DIGITAL IO

1Q03
HDMI
RX2+
RX2-
RX1+
RX1-
RX0+
RX0-
RXC+
RXC-

B12 HDMI

7D03 SII9993CT
HDMI PANELINK RECEIVER
7D05
AudioIN2L
AudioIN2R
10,11 AV3_HDMI-AUDIO_SEL B7

B23 CINCH ANALOGUE

SC2_L_MON_OUT
SC2_R_MON_OUT
OUT_MUTE
7202 MUTE
SC2_L
SC2_R
1R07
AUDIO OUT L/R

D SIDE AV

1302
AUDIO L/R IN
L_FRONT_IN
R_FRONT_IN
1M36 1K04

B17 SIDE CONNECTORS

FRONT_L_IN
FRONT_R_IN
SC1_L_RF_OUT
SC1_R_RF_OUT
N.C.

CONTROL

E CONTROL BOARD

Channel+ 1703
Channel- 1704
Menu 1705
Volume+ 1702
Volume- 1701
Power 1706
KEYBOARD
1M01
1K02 (1M01)

B17 SIDE CONNECTORS

KEYBOARD

B2 HERCULES

7217 TDA15021H
HERCULES
SEL_IF_SDM B1
4022
SERVICE SDM
STATUS_1 B3
STATUS_2 B3
EXT_MUTE B5
SOUND-ENABLE B5
SC_STANDBY B6 B15
AV2_DMMI_SW B15
1202

J LED PANEL

1040
+5V2-STBY
VS
GND OUT
RC
0345
1K00
IR
6070
LIGHT-SENSOR
6050 Green
6051 Red
7052
7062
7051
3061
3051
3063
LED1
LED2
LED_SEL
PC-TV-LED

B3 SYNC INTERFACE

3431 +3v3STBY
7430
6F00 +5VSW
3432 RES
ITV_IR_SW_RESET

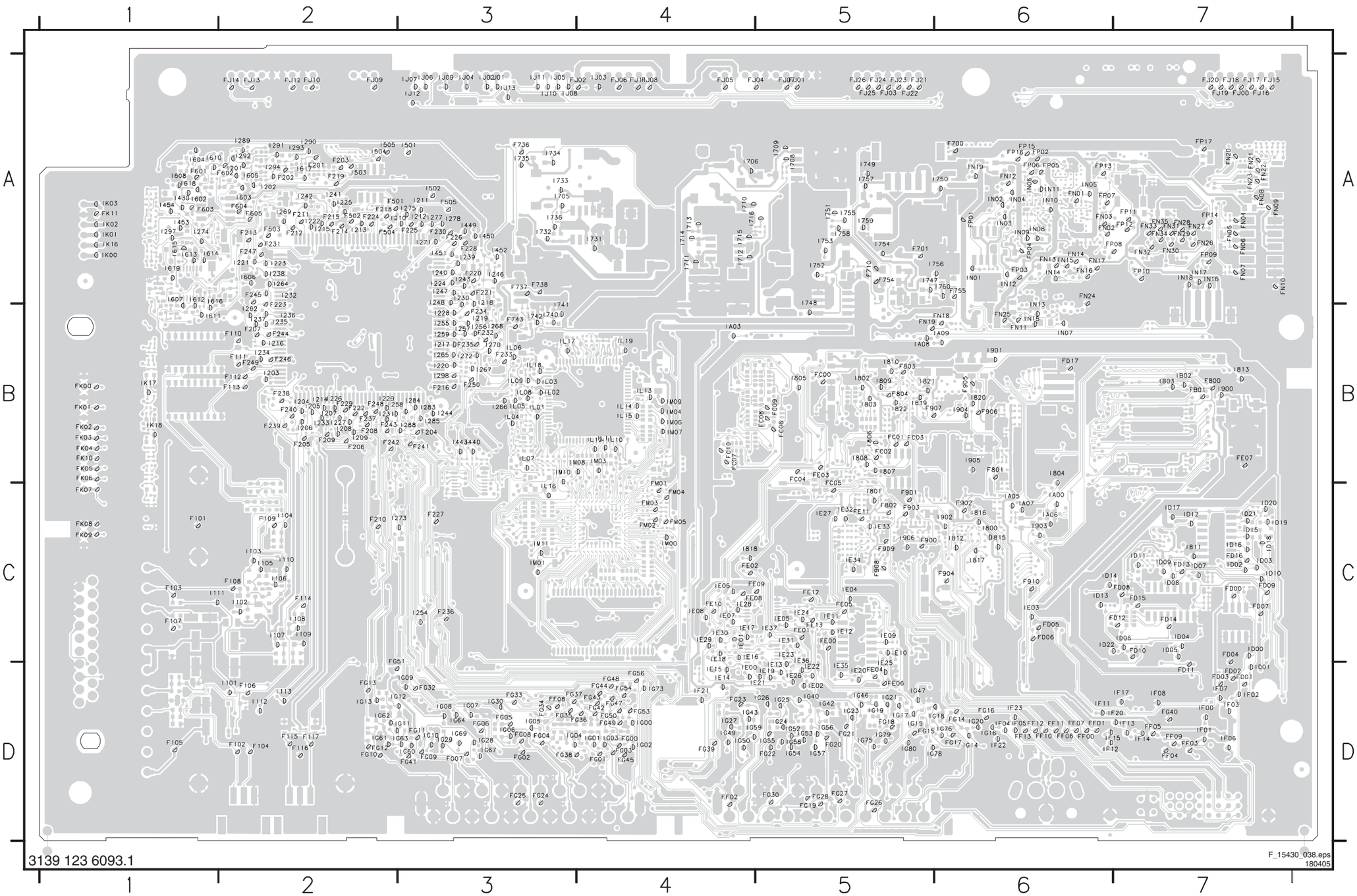
B6 DC-DC CONVERTER

+12VSW
5756
7754
5754
LVDS_VCC
PAN_VCC
3758
3755
7755
PANEL-PWR-CTL B8
+3V3STBY
7758
+3V3SW
3759
3750
7756
SC_STANDBY B2

F_15420_050.eps
130705

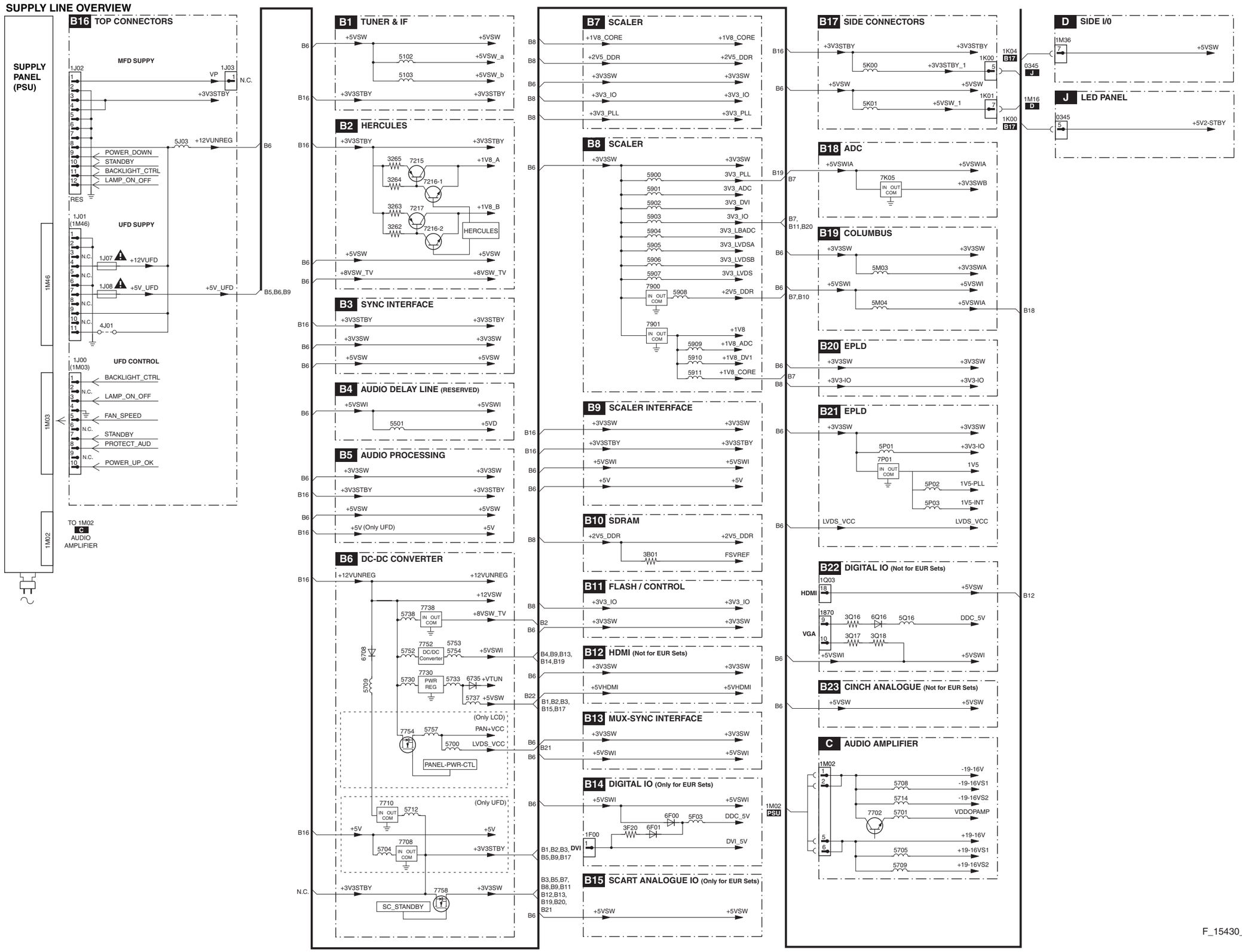
Testpoint Overview SSB (Top Side)

F101 C1 F102 D2 F103 C1 F104 D2 F105 D1 F106 D2 F107 C1 F108 C2 F109 C2 F110 B2 F111 B2 F112 B2 F113 B2
F114 C2 F115 D2 F116 D2 F117 D2 F200 A2 F201 A2 F202 A2 F203 A2 F204 B3 F205 B2 F206 B2 F207 B2 F208 B2 F209 B2
F210 C2 F211 A2 F212 A2 F213 A2 F214 A2 F215 A2 F216 B3 F217 A2 F218 A2 F219 A2 F220 A3 F221 A2 F222 B2 F223 B2
F224 A2 F225 A3 F226 A3 F227 C3 F228 A3 F229 B2 F230 A3 F231 A2 F232 B3 F233 B3 F234 B3 F235 B3 F236 C3
F237 B2 F238 B2 F239 B2 F240 B2 F241 B3 F242 B2 F243 B2 F244 B2 F245 A2 F246 B2 F247 A2 F248 B2 F249 B2
F250 B3 F501 A2 F502 A2 F503 A2 F504 A2 F505 A3 F506 B5 F600 A2 F601 A2 F602 A2 F603 A1 F604 A2 F605 A2 F606 A2 F607 A2 F608 A2 F609 A2 F610 A2 F611 A2 F612 A2 F613 A2 F614 A2 F615 A2 F616 A2 F617 A2 F618 A2 F619 A2 F620 A2 F621 A2 F622 A2 F623 A2 F624 A2 F625 A2 F626 A2 F627 A2 F628 A2 F629 A2 F630 A2 F631 A2 F632 A2 F633 A2 F634 A2 F635 A2 F636 A2 F637 A2 F638 A2 F639 A2 F640 A2 F641 A2 F642 A2 F643 A2 F644 A2 F645 A2 F646 A2 F647 A2 F648 A2 F649 A2 F650 A2 F651 C2 F652 A2 F653 A2 F654 A2 F655 A2 F656 A2 F657 A2 F658 A2 F659 A2 F660 A2 F661 A2 F662 A2 F663 A2 F664 A2 F665 A2 F666 A2 F667 A2 F668 A2 F669 A2 F670 A2 F671 A2 F672 A2 F673 A2 F674 A2 F675 A2 F676 A2 F677 A2 F678 A2 F679 A2 F680 A2 F681 A2 F682 A2 F683 A2 F684 A2 F685 A2 F686 A2 F687 A2 F688 A2 F689 A2 F690 A2 F691 A2 F692 A2 F693 A2 F694 A2 F695 A2 F696 A2 F697 A2 F698 A2 F699 A2 F700 A6 F701 A5 F702 A5 F703 A5 F704 A5 F705 A5 F706 A5 F707 A5 F708 A5 F709 A5 F710 A5 F711 A5 F712 A5 F713 A5 F714 A5 F715 A5 F716 A5 F717 A5 F718 A5 F719 A5 F720 A5 F721 A5 F722 A5 F723 A5 F724 A5 F725 A5 F726 A5 F727 A5 F728 A5 F729 A5 F730 A5 F731 A5 F732 A5 F733 A5 F734 A5 F735 A5 F736 A5 F737 A5 F738 A5 F739 A5 F740 A5 F741 A5 F742 A5 F743 A5 F744 A5 F745 A5 F746 A5 F747 A5 F748 A5 F749 A5 F750 A6 F751 A5 F752 A5 F753 A5 F754 A5 F755 A5 F756 A6 F757 A5 F758 A5 F759 A5 F760 A6 F800 C6 F801 C5 F802 B5 F803 B5 F804 B6 F805 B5 F806 B5 F807 B5 F808 B5 F809 B5 F810 B5 F811 C7 F812 C6 F813 B7 F815 C6 F816 C6 F817 C6 F818 C4 F819 B5 F820 B6 F821 B5 F822 B5 F900 C5 F901 C5 F902 C6 F903 C5 F904 C6 F905 B6 F906 B5 F907 B5 F908 C5 F909 C5 FB01 B7 FC00 B5 FC01 B5 FC02 B5 FC03 B5 FC04 B5 FC05 C5 FC06 B5 FC07 B4 FC08 B5 FC09 B5 FC10 B4 FD00 C7 FD01 D7 FD02 D7 FD03 D7 FD04 C7 FD05 C6 FD06 C6 FD07 C7 FD08 C7 FD09 C7 FD10 C7 FD11 D7 FD12 C7 FD13 C7 FD14 C7 FD15 C7 FD16 C7 FE00 C5 FE01 C5 FE02 C4 FE03 B5 FE04 D5 FE05 C5 FE06 D5 FE07 B7 FE08 C4 FE09 C5 FE10 C4 FE11 C5 FE12 C5 FE13 C5 FF00 D6 FF01 D6 FF02 D4 FF03 D7 FF04 D7 FF05 D7 FF06 D6 FF07 D6 FF08 D3 FF09 D7 FF10 D6 FF11 D6 FF12 D6 FF13 D6 FG00 D4 FG01 D4 FG02 D3 FG03 D4 FG04 D3 FG05 D3 FG06 D3 FG07 D3 FG08 D3 FG09 D3 FG10 D2 FG11 D3 FG12 D2 FG13 D2 FG14 D6 FG15 D5 FG16 D6 FG17 D6 FG18 D5 FG19 D5 FG20 D5 FG21 D5 FG22 D5 FG23 D4 FG24 D3 FG25 D3 FG26 D5 FG27 D5 FG28 D5 FG29 D4 FG30 D5 FG31 D5 FG32 D5 FG33 D3 FG34 D3 FG35 D3 FG36 D4 FG37 D3 FG38 D3 FG39 D4 FG40 D7 FG41 C2 FG42 D4 FG43 D3 FG44 D4 FG45 D4 FG46 D4 FG47 D4 FG48 D4 FG49 D4 FG50 D4 FG51 C2 FG52 D4 FG53 D4 FG54 D4 FG55 D4 FG56 D4 FG57 D4 FG58 D4 FG59 D4 FG60 D4 FG61 D4 FG62 D4 FG63 D4 FG64 D4 FG65 D4 FG66 D4 FG67 D4 FG68 D4 FG69 D4 FG70 D4 FG71 D4 FG72 D4 FG73 D4 FG74 D4 FG75 D4 FG76 D4 FG77 D4 FG78 D4 FG79 D4 FG80 D4 FH01 A5 FH02 A5 FH03 A5 FH04 A5 FH05 A5 FH06 A5 FH07 A5 FH08 A5 FH09 A5 FH10 A5 FH11 A5 FH12 A5 FH13 A5 FH14 A5 FH15 A5 FH16 A5 FH17 A5 FH18 A5 FH19 A5 FH20 A5 FH21 A5 FH22 A5 FH23 A5 FH24 A5 FH25 A5 FH26 A5 FH27 A5 FH28 A5 FH29 A5 FH30 A5 FH31 A5 FH32 A5 FH33 A5 FH34 A5 FH35 A5 FH36 A5 FH37 A5 FH38 A5 FH39 A5 FH40 A5 FH41 A5 FH42 A5 FH43 A5 FH44 A5 FH45 A5 FH46 A5 FH47 A5 FH48 A5 FH49 A5 FH50 A5 FH51 A5 FH52 A5 FH53 A5 FH54 A5 FH55 A5 FH56 A5 FH57 A5 FH58 A5 FH59 A5 FH60 A5 FH61 A5 FH62 A5 FH63 A5 FH64 A5 FH65 A5 FH66 A5 FH67 A5 FH68 A5 FH69 A5 FH70 A5 FH71 A5 FH72 A5 FH73 A5 FH74 A5 FH75 A5 FH76 A5 FH77 A5 FH78 A5 FH79 A5 FH80 A5 FH81 A5 FH82 A5 FH83 A5 FH84 A5 FH85 A5 FH86 A5 FH87 A5 FH88 A5 FH89 A5 FH90 A5 FH91 A5 FH92 A5 FH93 A5 FH94 A5 FH95 A5 FH96 A5 FH97 A5 FH98 A5 FH99 A5 FJ00 A5 FJ01 A5 FJ02 A5 FJ03 A5 FJ04 A5 FJ05 A5 FJ06 A5 FJ07 A5 FJ08 A5 FJ09 A5 FJ10 A5 FJ11 A5 FJ12 A5 FJ13 A5 FJ14 A5 FJ15 A5 FJ16 A5 FJ17 A5 FJ18 A5 FJ19 A5 FJ20 A5 FJ21 A5 FJ22 A5 FJ23 A5 FJ24 A5 FJ25 A5 FJ26 A5 FK00 A1 FK01 A1 FK02 A1 FK03 A1 FK04 A1 FK05 A1 FK06 A1 FK07 A1 FK08 A1 FK09 A1 FK10 B1 FK11 A1 FK16 A1 FK17 B1 FK18 B1 FL00 B3 FL01 B3 FL02 B3 FL03 B3 FL04 B3 FL05 B3 FL06 B3 FL07 B3 FL08 B3 FL09 B3 FL10 B4 FL11 B4 FL12 B4 FL13 B4 FL14 B4 FL15 B4 FL16 C3 FL17 B3 FL18 B3 FL19 B4 FM00 C4 FM01 C3 FM02 B4 FM03 B4 FM04 B4 FM05 B4 FM06 B4 FM07 B4 FM08 B4 FM09 B4 FM10 B3 FM11 C3 IN01 A6 IN02 A6 IN03 A6 IN04 A6 IN05 A6 IN06 A6 IN07 B6 IN08 A6 IN09 A6 IN10 A6 IN11 A6 IN12 A6 IN13 B6 IN14 A6 IN15 B6 IN16 A7 IN17 A7 IN18 A7 IN19 A6



I²C Overview

Supply Voltage Overview



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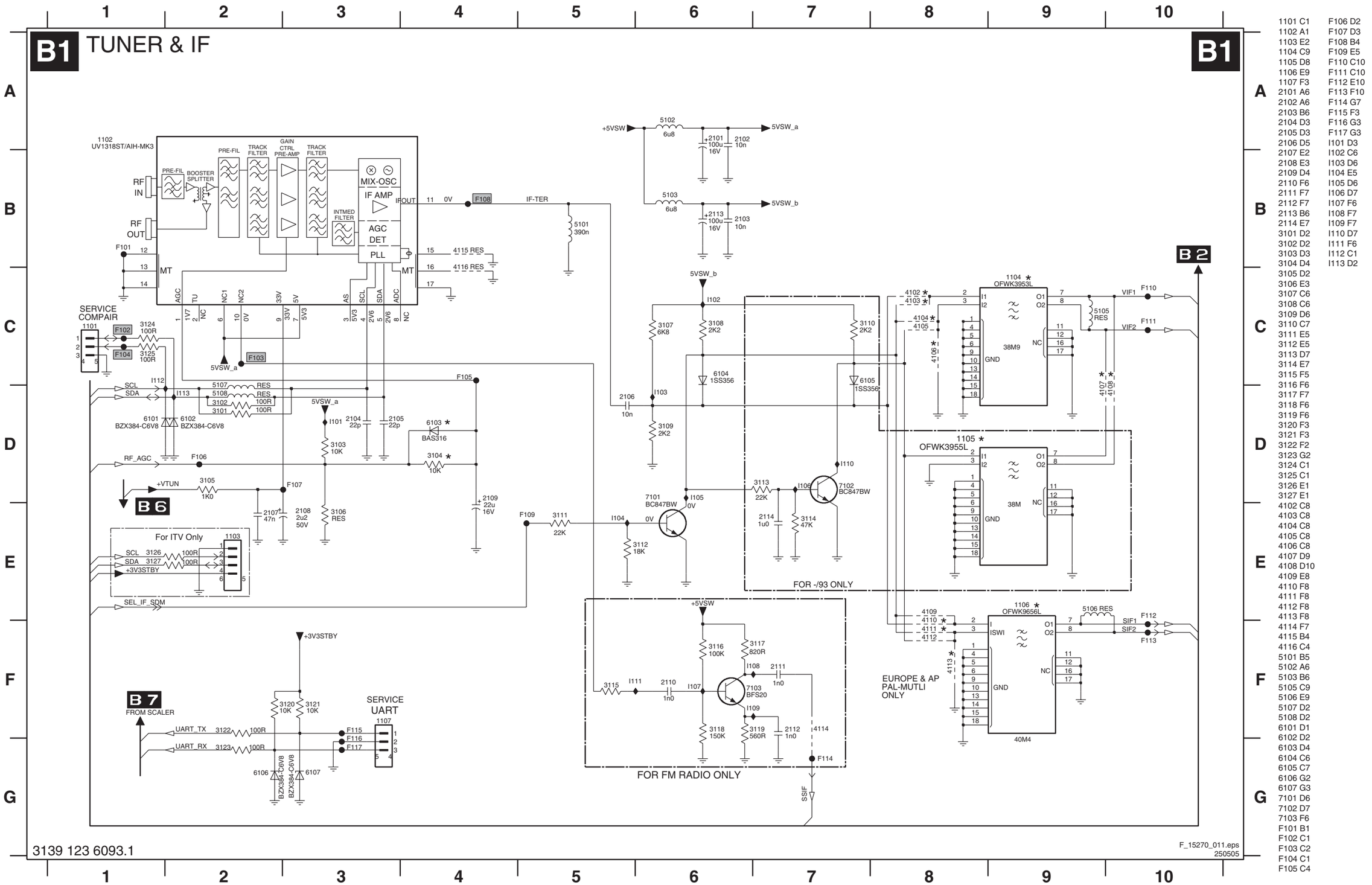
7. Circuit Diagrams and PWB Layouts

SSB: Tuner and VIF



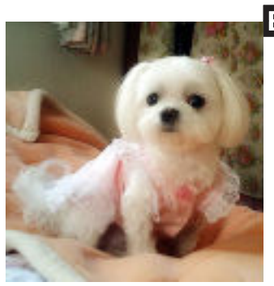
1101 C1 F106 D2
1102 A1 F107 D3
1103 E2 F108 B4
1104 C9 F109 E5
1105 D8 F110 C10
1106 E9 F111 C10
1107 F3 F112 E10
2101 A6 F113 F10
2102 A6 F114 G7
2103 B6 F115 F3
2104 D3 F116 G3
2105 D3 F117 G3
2106 D5 I101 D3
2107 E2 I102 C6
2108 E3 I103 D6
2109 D4 I104 E5
2110 F6 I105 D6
2111 F7 I106 D7
2112 F7 I107 F6
2113 B6 I108 F7
2114 E7 I109 F7
3101 D2 I110 D7
3102 D2 I111 F6
3103 D3 I112 C1
3104 D4 I113 D2
3105 D2
3106 E3
3107 C6
3108 C6
3109 D6
3110 C7
3111 E5
3112 E5
3113 D7
3114 E7
3115 F5
3116 F6
3117 F7
3118 F6
3119 F6
3120 F3
3121 F3
3122 F2
3123 G2
3124 C1
3125 C1
3126 E1
3127 E1
4102 C8
4103 C8
4104 C8
4105 C8
4106 C8
4107 D9
4108 D10
4109 E8
4110 F8
4111 F8
4112 F8
4113 F8
4114 F7
4115 B4
4116 C4
5101 B5
5102 A6
5103 B6
5105 C9
5106 E9
5107 D2
5108 D2
6101 D1
6102 D2
6103 D4
6104 C6
6105 C7
6106 G2
6107 G3
7101 D6
7102 D7
7103 F6
F101 B1
F102 C1
F103 C2
F104 C1
F105 C4

SSB: Hercules

1201 B7 3215 B6 5209 D5 I216 C10
1202 G10 3216 A6 5210 D5 I217 C11
2201 A3 3217 B7 5211 E5 I218 D3
2202 B3 3218 B7 5212 E5 I219 C5
2203 D2 3219 B7 5213 E5 I220 D5
2205 G4 3220 B7 5214 G9 I221 D5
2206 G4 3222 B8 5215 F10 I222 D5
2207 F5 3223 B8 5216 F10 I223 D5
2208 G4 3224 B8 5217 H7 I224 E5
2209 G4 3225 B8 5218 F2 I225 C10
2210 B5 3226 B9 6201 E4 I226 F8
2211 B6 3227 C8 6204 C11 I227 F6
2214 B6 3228 D2 6205 C11 I228 F7
2216 B6 3229 C9 6206 C12 I229 F7
2218 A7 3230 B9 7201-1 B1 I230 F7
2219 A7 3231 B9 7201-2 C2 I231 F7
2220 B7 3232 B9 7202-1 C2 I232 F8
2221 A7 3233 B9 7202-2 C3 I233 F8
2223 B8 3234 B9 7203-1 C3 I234 F8
2224 C8 3235 B9 7203-2 C3 I235 F8
2225 B10 3236 B9 7204-1 A4 I236 F8
2226 C10 3237 C9 7204-2 A3 I237 F8
2227 B11 3238 C10 7205-1 B4 I238 F9
2228 C5 3239 C10 7205-2 B4 I239 F9
2229 C5 3240 B10 7206 B6 I240 F10
2230 D5 3241 B10 7207 B11 I241 B10
2231 D5 3242 C10 7208 D2 I242 F4
2232 D5 3243 C10 7209 D2 I243 C4
2233 D5 3244 D2 7210 D3 I244 B7
2234 D4 3245 C10 7211 F4 I246 D2
2235 D4 3246 C11 7214 G3 I247 D4
2236 D5 3247 B11 7215 G4 I248 D4
2237 D5 3248 B11 7216-1 G3 I254 F6
2238 E5 3249 A11 7216-2 G3 I255 F6
2239 E5 3250 D2 7217 C6 I256 E7
2240 E5 3251 D3 7218 F11 I257 E7
2241 E5 3252 D3 7219 F2 I258 E7
2242 E5 3253 D3 F201 B2 I259 F8
2243 E5 3254 F3 F202 B2 I262 F8
2244 E5 3255 E2 F203 B3 I264 F9
2245 E5 3256 E2 F204 B3 I265 F10
2246 F5 3257 E3 F205 B6 I266 F10
2247 F6 3258 E2 F206 B6 I267 F11
2248 G6 3259 E2 F207 C7 I268 G11
2249 G6 3260 E3 F208 C7 I269 C11
2250 F7 3262 F3 F209 B7 I270 B11
2251 F7 3263 F3 F210 F1 I271 B10
2252 F7 3264 F4 F211 C9 I272 B10
2253 F7 3265 F4 F212 C8 I273 C9
2254 F7 3266 F4 F213 C10 I274 A9
2255 F7 3267 F4 F214 C10 I275 A9
2256 F8 3268 F5 F215 C10 I277 C8
2257 F8 3270 F7 F216 C10 I278 C8
2258 G5 3271 F7 F218 A11 I283 B6
2259 G8 3272 F8 F219 B12 I284 B6
2260 F8 3273 F8 F220 D3 I285 B6
2262 G8 3274 F8 F221 D3 I288 B6
2263 F8 3275 F9 F222 D5 I289 A3
2264 G8 3276 F9 F223 D5 I290 A3
2265 G8 3277 F10 F224 D5 I291 A4
2266 G8 3278 F11 F225 D5 I292 B3
2267 F8 3279 G11 F226 D5 I293 B3
2268 G8 3280 E4 F227 D4 I294 B3
2269 F9 3281 F8 F228 E5 I297 B8
2270 F9 3282 F3 F229 E5 I298 C7
2271 F9 3283 B8 F230 G4
2272 F9 3284 B8 F231 G4
2273 F10 3285 G6 F232 F5
2274 F10 3286 H6 F233 F5
2275 G9 3287 B7 F234 F5
2276 G10 3288 B7 F235 F5
2277 F10 3289 D2 F236 F6
2278 F11 3290 B8 F237 F6
2279 F11 3291 F2 F238 F6
2280 A3 3292 F2 F239 F6
2281 B3 3293 G2 F240 F6
2282 F10 3294 G2 F241 G7
2283 F10 3295 F8 F242 G7
2284 F10 3296 B5 F243 G7
2285 F6 4201 F5 F244 F8
2286 F7 4202 F5 F245 F9
2287 H7 4203 F5 F246 F10
2288 H6 4204 C9 F247 D11
2290 F3 4205 C9 F248 F8
2291 F2 4206 F3 F249 E11
2292 E11 4207 E2 F250 A7
2293 C10 4208 E2 I201 A5
3201 A3 4209 E3 I202 B5
3202 A4 4211 A4 I203 B6
3203 A4 4212 B4 I204 B6
3204 B3 4213 F5 I205 B6
3205 B4 4214 F5 I206 A7
3206 B4 4215 F5 I207 C7
3207 B6 5201 B5 I208 B7
3208 B6 5202 B5 I209 C8
3209 B6 5203 B7 I210 C8
3210 B6 5204 D5 I211 B8
3211 B6 5205 D5 I212 B9
3212 B6 5206 D4 I213 C10
3213 B6 5207 D4 I214 C10
3214 B7 5208 D5 I215 C10

SSB: Sync Interface

B3 SYNC INTERFACE



B17 TO SIDE CONNECTORS

+3V3STBY
+5VSW
3431 1K0
6430 BZX384-C2V7
I453
6431 1N4148
I430
LED_SEL
I454
0V
7430 PDTC114ET
3V1
3432 RES
ITV_IR_SW_RESET

B2

HOUT
I443
+3V3STBY
3451 4K7
4436 RES
+3V3SW
7436-1 74LVC14APW
3453 100R
3454 100R
Hsync_SDTV

B19 B18 B13

VSYNC
I440
4437 RES
+3V3SW
7436-2 74LVC14APW
3455 100R
3456 100R
Vsync_SDTV

B7

B18

COL_HREF
4440
H_DELAY
4438 RES
3458 100R
3463 RES
+3V3SW
7436-3 74LVC14APW
7436-4 74LVC14APW
3459 100R
H_1FH

B19

COL_VA
4441
Vsync_SDTV
4439 RES
3461 100R
2449 100n
7436-6 74LVC14APW
7436-5 74LVC14APW
3462 100R
V_1FH

B13

SC1_CVBS_RF_OUT

B2 & B15

1440
I449
I450
BM05B-SRSS-TBT

+12VSW
5431
I451
I452
2447 10p
2448 10p
1441
(NC)
S3B-PH-SM4-TB

FOR ITV ONLY

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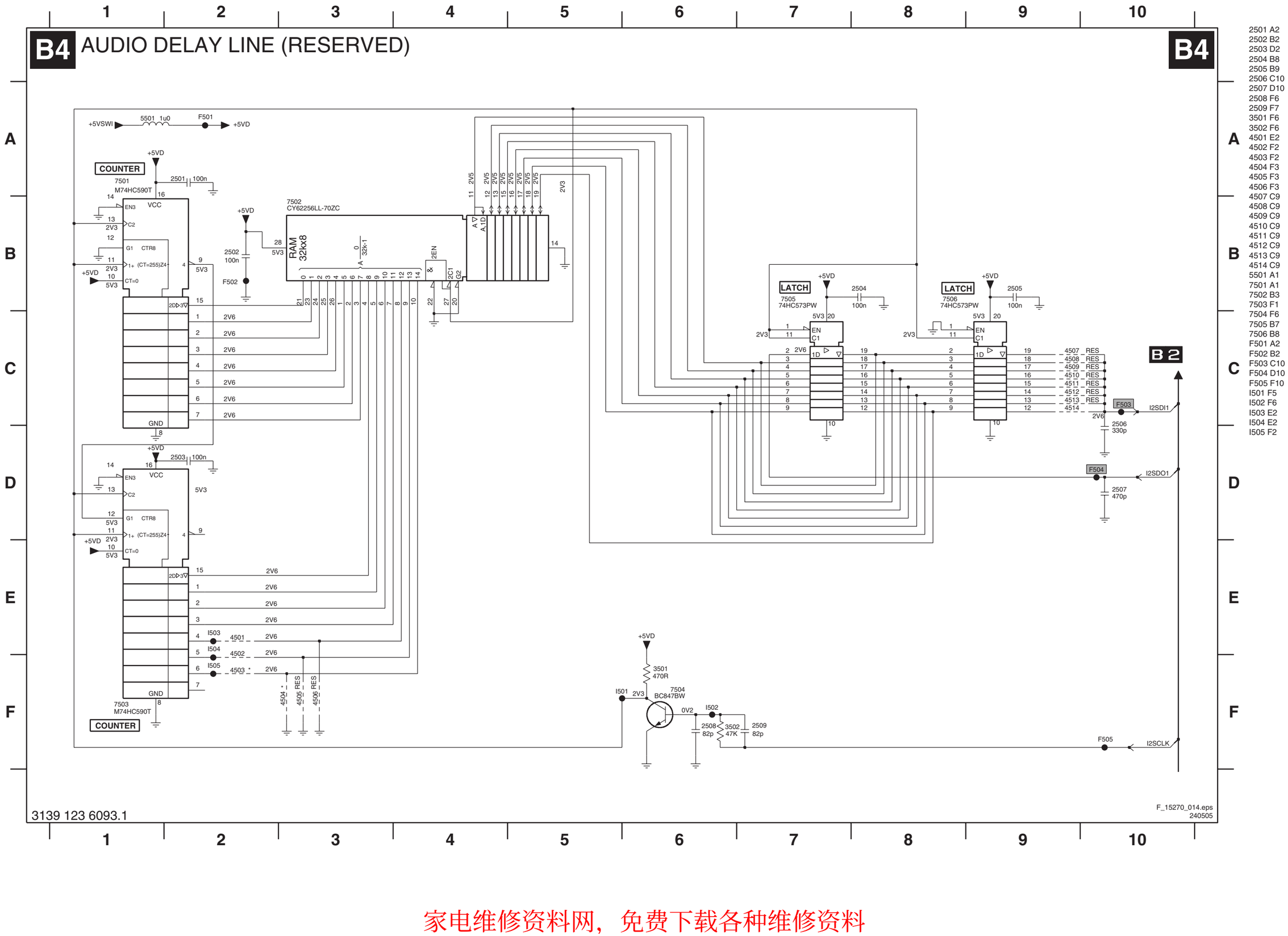
170505

3139 123 6093.1

1440 D9
1441 E9
2447 E8
2448 E9
2449 E4
3431 A3
3432 B3
3451 A5
3453 B6
3454 B7
3455 C6
3456 C7
3458 D2
3459 D4
3461 E2
3462 E4
3463 C4
4436 A6
4437 B6
4438 D2
4439 E2
4440 D2
4441 E2
5431 E8
6430 A3
6431 B3
7430 B3
7436-1 A6
7436-2 C7
7436-3 D3
7436-4 D4
7436-5 E4
7436-6 E3
I430 B3
I440 C6
I443 B5
I449 D8
I450 D8
I451 E9
I452 E9
I453 B3
I454 B2

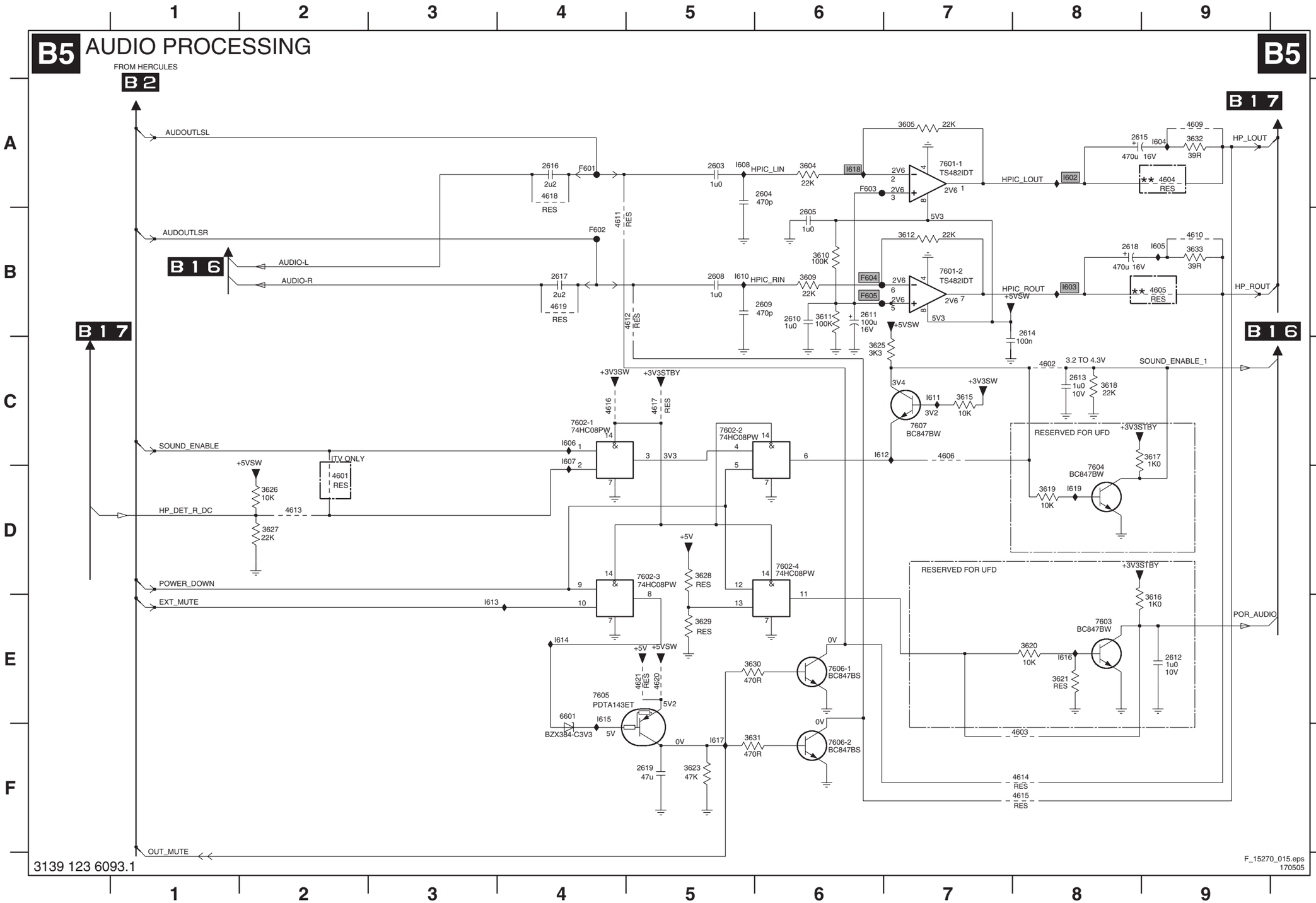
SSB: Audio Delay Line (Reserved)

B4 AUDIO DELAY LINE (RESERVED)



2501 A2
2502 B2
2503 D2
2504 B8
2505 B9
2506 C10
2507 D10
2508 F6
2509 F7
3501 F6
3502 F6
4501 E2
4502 F2
4503 F2
4504 F3
4505 F3
4506 F3
4507 C9
4508 C9
4509 C9
4510 C9
4511 C9
4512 C9
4513 C9
4514 C9
5501 A1
7501 A1
7502 B3
7503 F1
7504 F6
7505 B7
7506 B8
F501 A2
F502 B2
F503 C10
F504 D10
F505 F10
I501 F5
I502 F6
I503 E2
I504 E2
I505 F2

SSB: Audio Processing



2603 A5 I602 A8
2604 A6 I603 B8
2605 B6 I604 A9
2608 B5 I605 B9
2609 B6 I606 C4
2610 B6 I607 C4
2611 B6 I608 A5
2612 E9 I610 B5
2613 C8 I611 C7
2614 B8 I612 C6
2615 A8 I613 E3
2616 A4 I614 E4
2617 B4 I615 E4
2618 B8 I616 E8
2619 F5 I617 F5
3604 A6 I618 A6
3605 A7 I619 D8
3609 B6
3610 B6
3611 B6
3612 B7
3615 C7
3616 E9
3617 C9
3618 C8
3619 D8
3620 E8
3621 E8
3623 F5
3625 C6
3626 D2
3627 D2
3628 D5
3629 E5
3630 E5
3631 F5
3632 A9
3633 B9
4601 D2
4602 C8
4603 F8
4604 A9
4605 B9
4606 C7
4609 A9
4610 B9
4611 B4
4612 B4
4613 D2
4614 F8
4615 F8
4616 C4
4617 C5
4618 A4
4619 B4
4620 E5
4621 E5
6601 E4
7601-1 A7
7601-2 B7
7602-1 C4
7602-2 C5
7602-3 D5
7602-4 D6
7603 E8
7604 D8
7605 E4
7606-1 E6
7606-2 F6
7607 C7
F601 A4
F602 B4
F603 A6
F604 B6
F605 B6

SSB: DC-DC Converter

B6 DC-DC CONVERTER

B16 FROM TOP CONNECTORS

+12VUNREG — F701 — +12VSW

2704 10u 16V

+5V — I706 — 2706 10u 16V — 5704

7708 LF33CPT: IN, OUT, CTRL, NC, COM

I709 — I708 — 3708 10K — +12VUNREG

6708 SS24 — 6709 SS14 — 3709 6K8 — 2708 RES — 2709 47u 16V

I710 — 5709 10u — I711

7710 L5973D: VCC, VREF, OUT, INH, FB, SYNC, COMP, NC, GND_GND_HS

I712 — 5712 33u — I713 — 5713 10u — F710 +3V3STBY

I714 — I715 — 2715 22n — I716 — 3712 5K6 1%

6712 SS36 — 2714 220p — 3716 4K7 — 3713 3K3 1% — 2713 470u 16V — 2716 470u 16V

2710 10u — 2711 10u — SUP_GND2

FOR UFD ONLY

SUPPLY TO TUNER & HERCULES

7730 L5970D: VCC, COMP, INH, GND, OUT, FB, SYNC, VREF

+12VSW — 5730 10u — I731 — 2730 10u 25V — 2733 220p — I705 — 2734 22n — 3736 4K7

I733 — 5733 220u — 6733 SS14 — I734 — 3735 1K0 — 7735 BC817-25 — I735 — 2735 470p

6735 BAV99 — 2736 22u 35V — 6736 BZX384-C33 — F736 32V9 +VTUN — TO TUNER CELL B1

SUP_GND1

7738 L78M08CDT: IN, OUT, COM — +12VSW — 5738 — 2738 47u 16V — 2739 47u 16V

+3V3STBY — 3743 22K — 3742 15K — I742 — 7742 BC847BW

+12VUNREG — 6740 BZX384-C8V2 — I740 — 3740 1K5 — I741 — 3741 1K5 — 7741 BC847BW — 2741 220n

3732 1K0 1% — I732 — 3733 3K3 1% — I736 — 5737 10u — 2731 470u 16V — 2737 470u 16V

F737 +5VSW — F738 +8VSW_TV — F743 POWER_DOWN — B5 — B7 B16

TO HERCULES CELL B2

FOR UFD ONLY

FOR LCD ONLY

+5VSWI — +3V3STBY — +12VSW — I757 — I749 — I750 — 1751 RES

5758 RES — 5755 RES — 5756 — I756 — 7754 SI2301BDS-T1-E3 — 11V5 — SS = 4V9 — 5757

3755 10K — 2751 100n — I747 6V8 — 5759 RES — 7753 L4940D2T12 — I759

3758 15K — 3760 100R — 7755 PDTC114ET — I760 — PANEL-PWR-CTL — F755 (0V) 0V6

2759 RES — 2752 47u 16V — 2700 RES — 2701 100p — PAN_VCC — 5700 — F700 — LVDS_VCC 11V5

2760 1u0 25V — FOR UFD ONLY

B8 FROM SCALER — B21 TO EPLD

SUPPLY TO SCALER

7752 MC34063AD: DCOL, SWC, SWE, TIMC, IS, VCC, CIN_NEG, GND

S Q R — IPK OSC — REFERENCE REGULATOR

+12VSW — 5752 10u — 3751 1R0 — 3752 1R0 — I751 — I752 — 2753 470u 16V — 3753 1K0 1% — I753 — 1V2

11V7 — SWC 1 11V7 — SWE 2 — I755 — 3734 2K2 — TIMC 3 — I758 — 2756 470p — 5753 220u — 6751 SS14

GND — SUP_GND3 — 2754 RES — 3754 3K3 1% — I754 — 2755 4n7

5754 10u — F754 +5VSWI 5V4 — 2757 470u 16V — 2758 470u 16V

B7 TO SCALER CELL — B4 TO LIPSYNC

+3V3STBY — 3V2 — B2 FROM HERCULES — 3750 22K — 2750 2u2 — 2762 22u16V — 7758 SI9433BDY-T1-E3 SI4433DY

3759 1K0 — I748 — SC_STANDBY — 3V1 — 7756 PDTC114ET — 3761 100R — 2761 1u0 25V — FOR UFD ONLY

+3V3SW

3139 123 6093.1

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1751 A10	7738 F2
2700 B11	7741 G3
2701 B11	7742 G4
2704 A3	7752 D9
2706 B3	7753 B10
2708 C3	7754 A9
2709 C3	7755 B8
2710 C2	7756 G8
2711 C2	7758 F10
2713 D5	F700 B11
2714 D4	F701 A3
2715 D4	F710 B6
2716 D6	F736 E6
2730 E2	F737 F6
2731 G5	F738 F6
2733 F2	F743 G6
2734 E3	F754 E11
2735 F6	F755 C8
2736 E6	I705 E3
2737 G6	I706 B3
2738 G2	I708 B3
2739 G3	I709 B3
2741 G3	I710 C2
2750 F9	I711 C2
2751 B9	I712 C4
2752 B10	I713 C5
2753 E8	I714 C4
2754 E8	I715 D4
2755 F9	I716 D5
2756 E10	I731 E2
2757 E11	I732 F4
2758 E11	I733 E5
2759 B9	I734 F5
2760 B9	I735 E5
2761 G9	I736 F5
2762 F9	I740 G2
3708 B2	I741 G3
3709 C3	I742 G4
3712 D5	I747 B9
3713 D5	I748 F8
3716 D5	I749 A10
3732 F4	I750 A10
3733 F4	I751 D8
3734 D11	I752 E8
3735 F5	I753 E8
3736 F3	I754 E9
3740 G2	I755 D10
3741 G2	I756 B9
3742 G3	I757 A9
3743 G4	I758 D10
3750 F9	I759 B9
3751 D8	I760 B8
3752 D8	
3753 E8	
3754 E9	
3755 B9	
3758 B8	
3759 F8	
3760 B9	
3761 F9	
5700 B11	
5704 B4	
5709 C2	
5712 C4	
5713 C5	
5730 E2	
5733 F5	
5735 F5	
5737 F5	
5738 F1	
5752 D8	
5753 E11	
5754 E11	
5755 A9	
5756 A9	
5757 A9	
5758 A8	
5759 B9	
6708 C2	
6709 C2	
6712 D4	
6733 F5	
6735 E6	
6736 E6	
6740 G2	
6751 E11	
7708 B4	
7710 C3	
7730 E3	
7735 E5	

SSB: Diversity Tables B1-B6

B1 TUNER & IF

Item	AP - non China	Europe	NAFTA/LT	AP - DVB	Europe - DVB	China	Description
1102						V	TUN V+U PLL IEC BGDKM B
1102		V					TUN V+U PLL IEC BGHIL B
1102			V				TUNER UV1338/A F S H-4
1102	V						TUNER UV1316E/A I H-4
1102				V	V		TUNER UV1318SD/A CP H N-4
1104		V			V		FIL SAW SM 38MHZ9 OFWK3953L R
1104						V	FIL SAW SM 38MHZ OFWM3956L R
1104			V				FIL SAW SM 45MHZ75 OFWM1967L R
1104	V			V			FIL SAW SM 38MHZ9 OFWK7265L R
1105						V	FIL SAW SM 38MHZ OFWK3955L R
1106		V			V		FIL SAW SM 38MHZ9 OFWK9656L R
1106						V	FIL SAW SM 38MHZ OFWK9352L R
1106	V			V			FIL SAW SM 38MHZ9 OFWK9361L R
3101	V		V			V	RST SM 0603 100R PM5 COL
3102	V		V			V	RST SM 0603 100R PM5 COL
3104		V			V		RST SM 0603 10K PM5COL
3104	V		V	V		V	RST SM 0603 JUMP. 0R05 COL
3107	V	V		V	V	V	RST SM 0603 6K8 PM5 COL
3108	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3109	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3110						V	RST SM 0603 2K2 PM5 COL
3111	V	V		V	V	V	RST SM 0603 22K PM5 COL
3112	V	V		V	V	V	RST SM 0603 18K PM5 COL
3113						V	RST SM 0603 22K PM5 COL
3114						V	RST SM 0603 47K PM5 COL
4102	V	V	V	V	V		RST SM 0603 JUMP. 0R05 COL
4103						V	RST SM 0603 JUMP. 0R05 COL
4104	V			V			RST SM 0603 JUMP. 0R05 COL
4106		V	V		V	V	RST SM 0603 JUMP. 0R05 COL
4107						V	RST SM 0603 JUMP. 0R05 COL
4108						V	RST SM 0603 JUMP. 0R05 COL
4110	V	V		V	V	V	RST SM 0603 JUMP. 0R05 COL
4111		V			V		RST SM 0603 JUMP. 0R05 COL
4113	V			V		V	RST SM 0603 JUMP. 0R05 COL
5101	V	V		V	V	V	FXDIND SM 0805 0U39 PM10 COL R
5101			V				FXDIND SM 0805 0U68 PM10 COL R
5102	V	V	V	V		V	FXDIND SM 0805 12U PM10 COL R
5102					V		FXDIND SM 1008 6U8 PM5 COL R
5107				V	V		FXDIND 0603 100MHZ 600R COL R
5107		V					RST SM 0603 100R PM5 COL
5108				V	V		FXDIND 0603 100MHZ 600R COL R
5108		V					RST SM 0603 100R PM5 COL
6103		V			V		DIO SIG SM BAS316 (COL) R
6105						V	DIO SIG SM 1SS356 (RHM0) R
7101	V	V		V	V	V	TRA SIG SM BC847BW (COL) R
7102						V	TRA SIG SM BC847BW (COL) R

B2 HERCULES

Item	LC4.3A AB (DVB-T)	LC4.3E AB/LC4.8E AB/LC4.9E AB (DVB-T)	LC4.3U/L	LC4.3E/LC4.8E/LC4.9E	LC4.3E W/O 3D COMB FILTER	LC4.3A - CHINA	LC4.3A - AP (non-China)	Description
2203	V	V		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2229			V					CER2 0805 X5R 6V3 10U PM10 R
2244	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2245	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2246	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2255	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2286	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2289	V							CER2 0805 Y5V 10V 4U7 P8020 R
2289				V				RST SM 0603 150R PM5 COL
2290	V	V		V	V			CER2 0805 Y5V 10V 4U7 P8020 R
2291	V	V		V				CER2 0402 Y5V 16V 100N COL
2292		V						CER2 0402 Y5V 16V 100N COL
3250		V		V	V	V	V	RST SM 0402 100R PM5 COL
3251		V		V	V	V	V	RST SM 0402 100R PM5 COL
3252		V		V	V	V	V	RST SM 0402 100R PM5 COL
3253		V		V	V	V	V	RST SM 0402 100R PM5 COL
3255		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3256		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3257		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3258		V		V	V	V	V	RST SM 0402 1K PM5 COL
3259		V		V	V	V	V	RST SM 0402 1K PM5 COL
3260		V		V	V	V	V	RST SM 0402 1K PM5 COL
3270								RST SM 0402 10K PM5 COL
3282		V						RST SM 0603 150R PM5 COL
3285	V	V	V	V		V	V	RST SM 0402 JUMP. 0R05 COL
3286	V	V	V	V		V	V	RST SM 0402 100R PM5 COL
3291	V							RST SM 0402 47K PM5 COL
3292		V		V				RST SM 0402 12K PM5 COL
3292	V							RST SM 0402 47K PM5 COL
3293	V							RST SM 0402 47K PM5 COL
3294	V	V		V				RST SM 0402 47K PM5 COL
3295	V	V		V	V	V	V	RST SM 0402 100K PM5 COL
3296	V	V						RST SM 0402 100R PM5 COL
4206			V		V	V	V	RST SM 0805 JUMP. 0R05 COL R
4213	V	V						RST SM 0402 JUMP. 0R05 COL
4214	V	V						RST SM 0402 JUMP. 0R05 COL
4215	V	V						RST SM 0402 JUMP. 0R05 COL
5218	V	V		V				IND FXD 1206 EMI 100MHZ 120R R
6206	V	V						DIO SIG SM BAT54 SOD323 COL R
7208		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7209		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7210		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7217			V			V		IC SM TDA15011H/N1BD0 (PHSE) Y
7217	V	V		V	V		V	IC SM TDA15021H/N1B91 (PHSE) Y
7219	V	V		V				IC SM 74HC4053D (PHSE) R

B3 SYNC INTERFACE

Item	26/32PFxxxx - AP/NAFTA/LT	EU & AP DVB sets	LC4.3E/LC4.9x/LC4.8x/LC4.3A-China	26PF4310/10	Description
2449	V	V	V		CER2 0402 Y5V 16V 100N COL
3432		V			RST SM 0402 2K7 PM5 COL
3458	V	V	V		RST SM 0402 100R PM5 COL
3459	V	V	V		RST SM 0402 100R PM5 COL
3461	V	V	V		RST SM 0402 100R PM5 COL
3462	V	V	V		RST SM 0402 100R PM5 COL
4436				V	RST SM 0402 JUMP. 0R05 COL
4437				V	RST SM 0402 JUMP. 0R05 COL
4440	V	V	V		RST SM 0402 JUMP. 0R05 COL
4441	V	V	V		RST SM 0402 JUMP. 0R05 COL
6430	V		V	V	DIO REG SM PDZ2.4B (PHSE) R
6431	V		V	V	DIO SIG SM 1N4148WS (VISH) R
7436	V	V	V		IC SM 74LVC14APW (PHSE) R

B5 AUDIO WITHOUT AMPLIFIER

Item	26/32PF	37/42/50PF	Description
2612		V	CER2 0603 Y5V 10V 1U COL
2613	V		CER2 0603 Y5V 10V 1U COL
2616	V		CER2 0603 X5R 6V3 2U2 PM10 R
2617	V		CER2 0603 X5R 6V3 2U2 PM10 R
3615	V		RST SM 0402 10K PM5 COL
3616		V	RST SM 0402 1K PM5 COL
3617		V	RST SM 0402 1K PM5 COL
3618	V		RST SM 0402 22K PM5 COL
3619		V	RST SM 0402 10K PM5 COL
3620		V	RST SM 0402 10K PM5 COL
3623	V		RST SM 0402 47K PM5 COL
3625	V		RST SM 0402 3K3 PM5 COL
3627	V		RST SM 0402 22K PM5 COL
3628		V	RST SM 0402 10K PM5 COL
3629		V	RST SM 0402 22K PM5 COL
3630	V		RST SM 0402 330R PM5 COL
3630		V	RST SM 0402 470R PM5 COL
3631	V		RST SM 0402 330R PM5 COL
3631		V	RST SM 0402 470R PM5 COL
3632		V	RST SM 0402 RC31 39R PM5 R
3633		V	RST SM 0402 RC31 39R PM5 R
4601		V	RST SM 0603 JUMP. 0R05 COL
4602	V		RST SM 0603 JUMP. 0R05 COL
4603	V		RST SM 0603 JUMP. 0R05 COL
4606		V	RST SM 0603 JUMP. 0R05 COL
4609	V		RST SM 0603 JUMP. 0R05 COL
4610	V		RST SM 0603 JUMP. 0R05 COL
4611	V		RST SM 0603 JUMP. 0R05 COL
4612	V		RST SM 0603 JUMP. 0R05 COL
4613	V		RST SM 0603 JUMP. 0R05 COL
4614		V	RST SM 0603 JUMP. 0R05 COL
4615		V	RST SM 0603 JUMP. 0R05 COL
4616	V		RST SM 0603 JUMP. 0R05 COL
4617		V	RST SM 0603 JUMP. 0R05 COL
4618		V	RST SM 0603 JUMP. 0R05 COL
4619		V	RST SM 0603 JUMP. 0R05 COL
4620	V		RST SM 0603 JUMP. 0R05 COL
4621		V	RST SM 0603 JUMP. 0R05 COL
7603		V	TRA SIG SM BC847BW (COL) R
7604		V	TRA SIG SM BC847BW (COL) R
7607	V		TRA SIG SM BC847BW (COL) R

B6 DC DC CONVERTER

Item	26/32PF LCD	37/42PF LCD	42/50PF PDP	DVB PDP 42PF	DVB LCD 37PF	Description
2701	V	V			V	CER1 0402 NP0 50V 100P COL
2706		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2709		V	V	V	V	ELCAP SM 16V 47U PM20 COL R
2710		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2711		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2713		V	V	V	V	ELCAP SM SEV 16V 470U PM20 R
2714		V	V	V	V	CER2 0402 X7R 50V 220P COL
2715		V	V	V	V	CER2 0402 X7R 16V 22N PM10 R
2741		V	V	V	V	CER2 0603 X7R 10V 220N COL
2751	V	V			V	CER2 0402 Y5V 16V 100N COL
2752	V	V			V	ELCAP SM 16V 47U PM20 COL R
2760	V	V			V	CER2 1206 X7R 25V 1U PM10 R
2761		V	V	V	V	CER2 1206 X7R 25V 1U PM10 R
3708		V	V	V	V	RST SM 0402 10K PM5 COL
3709		V	V	V	V	RST SM 0402 6K8 PM5 COL
3712		V	V	V	V	RST SM 0603 RC22H 5K6 PM1 R
3713		V	V	V	V	RST SM 0603 RC22H 3K3 PM1 R
3716		V	V	V	V	RST SM 0402 4K7 PM5 COL
3740		V	V	V	V	RST SM 0402 1K5 PM5 COL
3741		V	V	V	V	RST SM 0402 1K5 PM5 COL
3742		V	V	V	V	RST SM 0402 15K PM5 COL
3743		V	V	V	V	RST SM 0402 22K PM5 COL
3755	V	V			V	RST SM 0402 10K PM5 COL
3758	V	V			V	RST SM 0402 15K PM5 COL
3760	V	V			V	RST SM 0402 100R PM5 COL
3761		V	V	V	V	RST SM 0402 100R PM5 COL
5700	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5704		V	V	V	V	IND FXD SM 1206 10U PM20 R
5709		V	V	V	V	IND FXD SM 7032 10U PM20 R
5712		V	V	V	V	IND FXD SM 12565 33U PM20 R
5713		V	V	V	V	INDFXD SM 10145 10U PM20 R
5756	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5757	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
6708		V	V	V	V	DIO REC SS24 COL R
6709		V	V	V	V	DIO REC SS14 COL R
6712		V	V	V	V	DIO REC SS36 COL R
6740		V	V	V	V	DIO REG SM PDZ8.2B (PHSE) R
7708		V	V	V	V	IC SM LF33CPT (ST00) R
7710		V	V	V	V	IC SM E-L5973D (ST00) R
7741		V	V	V	V	TRA SIG SM BC847BW (COL) R
7742		V	V	V	V	TRA SIG SM BC847BW (COL) R
7754	V	V			V	FET POW SM SI2301BDS-E3(VISH)R
7755	V	V			V	TRA SIG SM PDTC114ET (COL) R

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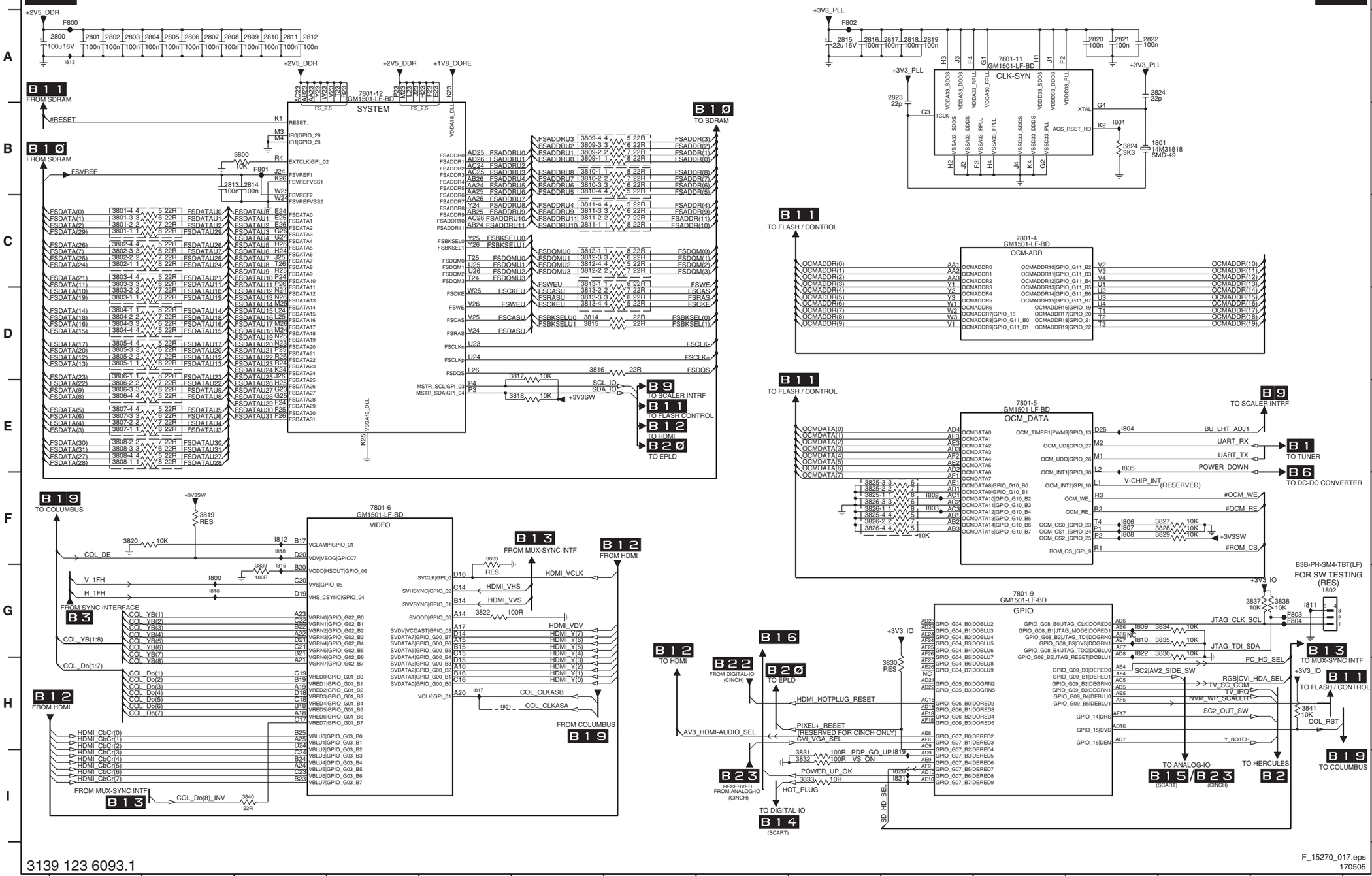
SSB: Scaler

B7 SCALER



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1801 B12 7801-12 A4
1802 G14 7801-4 C11
2800 A1 7801-5 E11
2801 A1 7801-6 F4
2802 A1 7801-9 G11
2803 A1 F800 A1
2804 A2 F801 B3
2805 A2 F802 A9
2806 A2 F803 G14
2807 A2 F804 G14
2808 A2 I800 G2
2809 A3 I801 B12
2810 A3 I802 F10
2811 A3 I803 F10
2812 A3 I804 E12
2813 B2 I805 E12
2814 B3 I806 F12
2815 A9 I807 F12
2816 A9 I808 F12
2817 A10 I809 G12
2818 A10 I810 G12
2819 A10 I811 G14
2820 A12 I812 F3
2821 A12 I813 A1
2822 A12 I815 G3
2823 A10 I816 G2
2824 A12 I817 H5
3800 B3 I818 F3
3801-1 C1 I819 I10
3801-2 C1 I820 I10
3801-3 C1 I821 I10
3801-4 C1 I822 G12
3802-1 C1
3802-2 C1
3802-3 C1
3802-4 C1
3803-1 D1
3803-2 D1
3803-3 C1
3803-4 C1
3804-1 D1
3804-2 D1
3804-3 D1
3804-4 D1
3805-1 D1
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3807-4 E1
3808-1 E1
3808-2 E1
3808-3 E1
3808-4 E1
3809-1 B6
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3809-4 B6
3810-1 B6
3810-2 B6
3810-3 B6
3810-4 B6
3811-1 C6
3811-2 C6
3811-3 C6
3811-4 C6
3812-1 C6
3812-2 C6
3812-3 C6
3812-4 C6
3813-1 C6
3813-2 D6
3813-3 D6
3813-4 D6
3814 D6
3815 D6
3816 D6
3817 D6
3818 E6
3819 F2
3820 F1
3822 G5
3823 F5
3824 B12
3825-1 F9
3825-2 F9
3825-3 F9
3825-4 F9
3826-1 F9
3826-2 F9
3826-3 F9
3826-4 F9
3827 F13
3828 F13
3829 F13
3830 H10
3831 I9
3832 I9
3833 I9
3834 G13
3835 G13
3836 G13
3837 G14
3838 G14
3839 G3
3840 I3
3841 H14
4801 H5
7801-11 A11

SSB: Scaler

B8 SCALER

SUPPLY FOR SCALER

+3V3SW
5900 → +3V3_PLL
5901 → +3V3_ADC
5902 → +3V3_DVI
5903 → +3V3_IO
5904 F900 → +3V3_LBADC
5905 → +3V3_LVDSA
5906 → +3V3_LVDSB
5907 → +3V3_LVDS

+3V3SW
7900 LF25CDT (IN 1, OUT 3, COM 2) I900
2900 100n
2901 1n0
2902 470u 16V
5908 → +2V5_DDR

+3V3SW
7901 LD1086D2T18 (IN I901 3, OUT 2, COM) I902 +1V8
2903 100n
2904 47u 16V
5909 → +1V8_ADC
5910 → +1V8_DVI
5911 → +1V8_CORE

+3V3_IO
F901
2905 100u 16V
2906 2907 2908 2909 2910 2911 2912 2913 2914 2915 100n
2916 100n

+1V8_CORE
F902
2917 100u 16V
2918 2919 2920 2921 2922 2923 2924 2925 2926 2927 2928 2929 100n

7801-13 GM1501-LF-BD SUPPLY
IO_3.3: AC10 AC8 AC6 AC4 AB4 AA4 Y4 W4 D23 D22 D17
CORE_1.8: U17 U16 U11 U10 T7 T6 T1 L16 L11 K17 K16 K11 K10
D_GND: A13 B13 K12 K13 K14 K15 L10 L12 L13 L14 L15 L17 M10 M11 M12 M13 M14 M15 M16 M17 N10 N11 N12 N13 N14 N15 N16 N17 P10 P11 P12 P13 P14 P15 P16 P17 R10 R11 R12 R13 R14 R15 R16 R17 T10 T12 T13 T14 T15 U12 U13 U14 U15 AD18
I905

F903
2930 2931 2932 2933 100n
+1V8_DVI
D6 D8 D9 D10
DVI_1.8

7801-2 GM1501-LF-BD DVI
DVI_SCL|GPI_07 N4
DVI_SDA|GPI_08 N3
RXCp A6
RXCn B6
RX0p A8
RX0n B8
RX1p A9
RX1n B9
RX2p A10
RX2n B10
REXT B11

+3V3_DVI
C10 C9 C8 C6
DVI_3.3
F904
2934 47u 16V
2935 2936 2937 2938 2939 100n

DVI_GND
A7 A11 B5 B7 C7 D7 D11
I906

B14 TO DIGITAL-IO (SCART ONLY)
SCL_DVI
SDA_DVI
RXC+IN
RXC-IN
RX0+IN
RX0-IN
RX1+IN
RX1-IN
RX2+IN
RX2-IN

B2
KEYBOARD 4900 RES

+3V3_LBADC
2940 47u 16V
2941 100n
2942 100n

7801-3 GM1501-LF-BD ADC
C13
C12 LBADC_IN1
(RES) B12 LBADC_IN2
(RES) A12 LBADC_IN3
D12 LBADC_RETURN
LBADC_GND
D13
LBADC_33

7801-14 GM1501-LF-BD NC
NC A1
NC C5
NC D5
AC17 NC
K3 NC
F1 NC

7801-10 GM1501-LF-BD DISPLAY PWR
LVDSA_GND_1 AD19
LVDSA_GND_2 AC19
LVDSA_GND_3 AC20
LVDSB_GND_1 AC13
LVDSB_GND_2 AC14
LVDSB_GND_3 AC15
VSSD33_LVDS AD17
VDDD33_LVDS AE17
LVDSA_3.3_3 AC22
LVDSA_3.3_2 AC21
LVDSA_3.3_1 AD20
LVDSB_3.3_3 AC12
LVDSB_3.3_2 AD13
LVDSB_3.3_1 AD12

+3V3_LVDS
F905
+3V3_LVDSA
F906
2945 22u 16V
2946 2947 2948 100n
2949 100n
+3V3_LVDSB
F907
2950 22u 16V
2951 2952 100n

B13 TO MUX-SYNC INTERFACE
B18 ADC
B19 & B2 TO COLUMBUS / HERCULES
B16 TO TOP CONN.

+3V3STBY
3901 3902 RES
2953 2954 100n
F908
+1V8_ADC
+3V3_ADC
F909
2955 22u 16V
2956 2957 2958 2959 100n

7801-1 GM1501-LF-BD ANA-IN
ADC_1.8: A4 A3
ADC_3.3: B3 E3 D3 A2
AVSYNC L3
AHSYNC L4
SCL 3903 100R N2 VGA_SCL|GPI_05
SDA 3904 100R N1 VGA_SDA|GPI_06
SOG C3
R_PR+ D2 REDp
R_PR- D1 REDn
G_Y+ C2 GREENp
G_Y- C1 GREENn
B_PB+ B2 BLUEp
B_PB- B1 BLUEn
ADC_AGND: C4 D4 E1 E2 E4
ADC_DGND: A5 B4
F910

7801-7 GM1501-LF-BD CTRL
3900 3K3 I904 AC16 OEXTR
FAN_SPEED C26 PWM0|GPIO_10
HD_FILTER C25 PWM1|GPIO_11
PPWR|GPIO_08 A26 PANEL-PWR-CTL
PBIAS|GPIO_09 B26 LAMP_ON_OFF
DCLK|GPIO_17 AC7 NC
PWM2|GPIO_12 D26 I903 BU_LHT_ADJ2 (RES)
FROM DC-DC CONVERTER B6

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2900 D1 F906 D10
2901 D2 F907 D10
2902 D2 F908 E9
2903 E1 F909 E10
2904 E2 F910 G9
2905 A4 I900 C2
2906 A4 I901 E1
2907 A4 I902 E2
2908 A4 I903 G6
2909 A4 I904 F4
2910 A5 I905 C4
2911 A5 I906 E6
2912 A5
2913 A5
2914 A6
2915 A6
2916 A6
2917 A7
2918 A7
2919 A7
2920 A7
2921 A7
2922 A8
2923 A8
2924 A8
2925 A8
2926 A9
2927 A9
2928 A9
2929 A9
2930 C5
2931 C5
2932 C5
2933 C5
2934 C7
2935 C7
2936 C7
2937 C8
2938 C8
2939 C8
2940 B9
2941 B10
2942 C9
2945 D10
2946 D11
2947 D11
2948 D11
2949 D11
2950 D10
2951 D11
2952 D11
2953 E8
2954 E8
2955 E10
2956 E10
2957 E10
2958 E11
2959 E11
3900 F4
3901 E8
3902 E8
3903 F8
3904 F8
4900 B9
5900 A1
5901 B1
5902 B1
5903 B1
5904 B1
5905 C1
5906 C1
5907 C1
5908 C2
5909 D2
5910 E2
5911 E2
7801-1 F9
7801-10 C9
7801-13 B6
7801-14 A10
7801-2 C6
7801-3 B10
7801-7 F5
7900 C1
7901 D1
F900 B2
F901 A4
F902 A7
F903 C5
F904 C7
F905 D10

SSB: Scaler Interface

B9 SCALER INTERFACE

7801-8
GM1501-LF-BD

ACp|GPIO_G06_B6|DORED8 AE20
ACn|GPIO_G06_B7|DORED9 AF20
A3p|GPIO_G06_B4|DORED6 AE19
A3n|GPIO_G06_B5|DORED7 AF19
A2p|GPIO_G05_B1|DOGRN3 AE21
A2n|GPIO_G05_B2|DOGRN4 AF21
A1p|GPIO_G05_B4|DOGRN6 AE22
A1n|GPIO_G05_B5|DOGRN7 AF22
A0p|GPIO_G05_B6|DOGRN8 AE23
A0n|GPIO_G05_B7|DOGRN9 AF23
NC
SHIELD5|DEBLU5 AD14
SHIELD4|DEBLU2 AE13
SHIELD3|DEGRN5 AE11
SHIELD2|DEGRN4 AD11
SHIELD1|DEGRN3 AC11
SHIELD0|DEGRN2 AF10
BCp|DEGRN8 AE12
BCn|DEGRN9 AF13
B3p|DEGRN6 AF11
B3n|DEGRN7 AF12
B2p|DEBLU3 AF14
B2n|DEBLU4 AE14
B1p|DEBLU6 AF15
B1n|DEBLU7 AE15
B0p|DEBLU8 AF16
B0n|DEBLU9 AE16
LVDS

TXBC+ TXBC-
TXB3+ TXB3-
TXB2+ TXB2-
TXB1+ TXB1-
TXB0+ TXB0-

B20 TO EPLD

B7 TO SCALER

BU_LHT_ADJ1
3A02 1K0
RESERVED
IA07
4A02 RES
RES +5VSWI
3A03 RES
3A05 RES
7A01 SI2301DS-T1
IA06
3A06 10K
IA00
2A03 1u0
3A04 1K0
4A03
IA05
BACKLIGHT_DIM
B20 FROM EPLD
BACKLIGHT_CTRL
B16 TO TOP CONNECTORS

FOR PDP ONLY
+3V3SW
3A07 10K
3A08 10K
2A00 100n
5A00
7A00 PCA9515ADP
VCC
SDA1
SDA0
SCL1
SCL0
EN
NC
GND
SDA_DMA_BUS1_DISP
SCL_DMA_BUS1_DISP
3A00 68R
3A01 68R
IA08
IA09
SDA_IO
SCL_IO
BUF_ENABLE
4A04 (PDP)
2A01 100p
2A02 100p
4A00_RES
4A01_RES
B21 TO EPLD

FOR UFD ONLY
+3V3STBY
2A13 100n
3A13 10K
3A11 4K7
+5V
3A14 4K7
7A03 BC847BW
7A02 BC847BW
B2 FROM HERCULES
SC_STANDBY
3A10 10K
IA03
2A12 10n
6A01 BZX384-C3V9
STANDBY
4A05
4A06

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2A00 E3
2A01 F2
2A02 F2
2A03 C7
2A12 F6
2A13 E8
3A00 E2
3A01 E2
3A02 C5
3A03 C6
3A04 C6
3A05 C6
3A06 C7
3A07 E2
3A08 E2
3A10 F6
3A11 E7
3A13 E8
3A14 E9
4A00 F3
4A01 F3
4A02 B6
4A03 D6
4A04 F4
4A05 F6
4A06 F8
5A00 E3
6A01 F8
7801-8 A2
7A00 E4
7A01 C6
7A02 F6
7A03 E8
IA00 C7
IA03 F6
IA05 B8
IA06 C7
IA07 B6
IA08 E3
IA09 E3

SSB: SDRAM

B10 SDRAM

+2V5_DDR

2B01 47u 16V
2B02 47u 6.3V
2B03 100n
2B04 100n
2B05 100n
2B06 100n
2B07 100n
2B08 100n
2B09 100n
2B10 100n
2B11 100n
2B12 100n
2B13 100n
2B14 100n
2B15 100n
2B16 100n

B 7 TO/FROM SCALER

3B01 10K 1%
3B02 10K 1%
FSVREF
FB01
2B18 16V 22u
2B17 100n

7B01 K4D263238F-UC50
SDRAM 1M X 32 X 4

VREF VDD VDDQ VSS VSSQ
CS RAS CAS WE CK CKE DM BA A NC RFU MCL DQS

FSRAS FSCAS FSWE FSCLK+ FSCLK- FSCKE
3B03 150R 1%
IB03 IB02
FSDQM(0) FSDQM(1) FSDQM(2) FSDQM(3)
FSBKSEL(0) FSBKSEL(1)
FSADDR(0) FSADDR(1) FSADDR(2) FSADDR(3) FSADDR(4) FSADDR(5) FSADDR(6) FSADDR(7) FSADDR(8) FSADDR(9) FSADDR(10) FSADDR(11)

FSDQS

FSDATA(0) FSDATA(1) FSDATA(2) FSDATA(3) FSDATA(4) FSDATA(5) FSDATA(6) FSDATA(7) FSDATA(8) FSDATA(9) FSDATA(10) FSDATA(11) FSDATA(12) FSDATA(13) FSDATA(14) FSDATA(15) FSDATA(16) FSDATA(17) FSDATA(18) FSDATA(19) FSDATA(20) FSDATA(21) FSDATA(22) FSDATA(23) FSDATA(24) FSDATA(25) FSDATA(26) FSDATA(27) FSDATA(28) FSDATA(29) FSDATA(30) FSDATA(31)

B 7 TO/FROM SCALER

2B01 A1
2B02 A1
2B03 A1
2B04 A1
2B05 A2
2B06 A2
2B07 A2
2B08 A3
2B09 A3
2B10 A3
2B11 A3
2B12 A4
2B13 A4
2B14 A4
2B15 A5
2B16 A5
2B17 B4
2B18 B4
3B01 B3
3B02 B3
3B03 C2
7B01 C3
FB01 B3
IB02 C2
IB03 C2

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SSB: Flash / Control

B11 FLASH / CONTROL

B 7 TO SCALER

+3V3_IO
5C00
FC00
2C00
100n
2C01
10u 16V

7C00
M29W040B-55K1
ROM
512Kx8
[FLASH]

OCMADDR(0) 12
OCMADDR(1) 11
OCMADDR(2) 10
OCMADDR(3) 9
OCMADDR(4) 8
OCMADDR(5) 7
OCMADDR(6) 6
OCMADDR(7) 5
OCMADDR(8) 27
OCMADDR(9) 26
OCMADDR(10) 23
OCMADDR(11) 25
OCMADDR(12) 4
OCMADDR(13) 28
OCMADDR(14) 29
OCMADDR(15) 3
OCMADDR(16) 2
OCMADDR(17) 30
OCMADDR(18) 1

#OCM_RE 24 OE
#OCM_WE 31 WE
#ROM_CS 22 CE

A 0 512K-1
DQ 0 7
32
16

OCMDATA(0) 13
OCMDATA(1) 14
OCMDATA(2) 15
OCMDATA(3) 17
OCMDATA(4) 18
OCMDATA(5) 19
OCMDATA(6) 20
OCMDATA(7) 21

B 7 TO SCALER

OCMADDR(0:19)
OCMDATA(0:7)

+3V3_IO
3C04-1 1 10K 8
3C04-2 2 10K 7
3C04-3 3 10K 6
3C04-4 4 10K 5
3C05 10K

3C11 RES
3C12 RES
3C13 RES
3C14 RES
3C15 RES

3C06-1 1 10K 8
3C06-2 2 10K 7
3C06-3 3 10K 6
3C06-4 4 10K 5

3C07-1 1 10K 8
3C07-2 2 10K 7
3C07-3 3 10K 6
3C07-4 4 10K 5

3C08-2 2 10K 7
3C08-1 1 10K 8
3C08-3 3 10K 6
3C08-4 4 10K 5

3C09-1 1 10K 8
3C09-2 2 10K 7
3C09-3 3 10K 6
3C09-4 4 10K 5

3C10-1 1 10K 8
3C10-2 2 10K 7
3C10-3 3 10K 6
3C10-4 4 10K 5

+3V3_IO
3C16-4 5
3C17 10K
3C16-3 6 10K
3C16-1 8
3C16-2 7
3C18 10K

FC09 FC10
FC08
FC07
FC06

3C19 RES
3C20 RES
3C21 RES

+3V3SW
3C00 10K
2C02 100n
3V2
7C01 M24C32-WMN6
Φ (4Kx8) EEPROM
WC SCL SDA ADR

NVM_WP_SCALER 0V FC01
SCL_IO 3V2 FC02
SDA_IO 3V2 FC03

+3V3SW
3V2
2C03 100n
1C00 SKQR
For Software Development only - (RES)
FC04
3C01 10K
7C02 PST596J
MR SUB VCC GND VOUT
FC05 3V2
#RESET
3C02 1K0
3C03 RES

B 7 & B 12 TO SCALER TO HDMI
& B 19 TO COLUMBUS

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1C00 E4
2C00 A3
2C01 A3
2C02 E2
2C03 E5
3C00 E2
3C01 E5
3C02 E6
3C03 E6
3C04-1 A6
3C04-2 A6
3C04-3 A6
3C04-4 A6
3C05 A6
3C06-1 B5
3C06-2 B5
3C06-3 B5
3C06-4 B5
3C07-1 B5
3C07-2 B5
3C07-3 B5
3C07-4 B5
3C08-1 B5
3C08-2 B5
3C08-3 C5
3C08-4 C5
3C09-1 C5
3C09-2 C5
3C09-3 C5
3C09-4 C5
3C10-1 C5
3C10-2 C5
3C10-3 C5
3C10-4 C5
3C11 A6
3C12 A6
3C13 A6
3C14 B6
3C15 B6
3C16-1 B7
3C16-2 B7
3C16-3 B6
3C16-4 B6
3C17 B6
3C18 B7
3C19 C6
3C20 C7
3C21 C7
5C00 A3
7C00 A2
7C01 E3
7C02 E5
FC00 A3
FC01 E2
FC02 E2
FC03 E2
FC04 E4
FC05 E6
FC06 C6
FC07 C6
FC08 C7
FC09 B7
FC10 B7

SSB: HDMI

2D00 A3	2D06 F4	2D12 A5	2D18 B6	2D24 B7	2D30 B8	2D36 G11	2D44 F14	3D04 C2	3D10 C5	3D15-4 C11	3D17-2 D11	3D18-4 D11	3D21-4 F9	3D27 H13	3D35 H12	5D03 A7	7D04 E11	FD04 D2	FD10 A6	FD16 E13	ID04 F5	ID10 G12	ID16 E13	ID22 F4
2D01 C2	2D07 A5	2D13 B5	2D19 B6	2D25 B7	2D31 B8	2D37 H11	2D45 G14	3D05 C4	3D11 F4	3D16-1 C11	3D17-3 D11	3D19 E12	3D22 G9	3D30 F14	4D00 F13	5D04 A7	7D05 F13	FD05 G2	FD11 A7	FD17 H7	ID05 F5	ID11 G12	ID17 E13		
2D02 C3	2D08 B5	2D14 B5	2D20 A7	2D26 B7	2D32 E11	2D38 G12	3D00 A2	3D06 C4	3D12 F4	3D16-2 C11	3D17-4 D11	3D20 E12	3D23 G9	3D31 F14	4D01 F13	7D00 A2	FD00 B3	FD06 G2	FD12 F9	ID00 C3	ID06 F5	ID12 H12	ID18 F14		
2D03 F4	2D09 B5	2D15 B5	2D21 B6	2D27 A8	2D33 E11	2D39 G12	3D01 A3	3D07 D4	3D15-1 B11	3D16-3 C11	3D18-1 D11	3D21-1 G9	3D24 G11	3D32 G14	5D00 A5	7D01 D3	FD01 C2	FD07 A5	FD13 E11	ID01 D3	ID07 G5	ID13 H12	ID19 G14		
2D04 F4	2D10 B5	2D16 B5	2D22 B6	2D28 B8	2D34 E12	2D40 G12	3D02 A3	3D08 D4	3D15-2 B11	3D16-4 C11	3D18-2 D11	3D21-2 G9	3D25 H11	3D33 G14	5D01 A6	7D02 D4	FD02 C2	FD08 A6	FD14 E12	ID02 D4	ID08 G10	ID14 H12	ID20 F14		
2D05 F4	2D11 B5	2D17 A6	2D23 A7	2D29 B8	2D35 E12	2D41 H13	3D03 C2	3D09 C5	3D15-3 C11	3D17-1 C11	3D18-3 D11	3D21-3 F9	3D26 G12	3D34 H11	5D02 A6	7D03 C5	FD03 C2	FD09 A6	FD15 F10	ID03 D4	ID09 G11	ID15 F13	ID21 G14		

SSB: MUX-Sync Interface

B13 MUX-SYNC INTERFACE

B13

B2 FROM HERCULES

R_SDTV FE00
G_SDTV FE01
B_SDTV FE02

3E00 56R
3E01 56R
3E02 56R

RESERVED

3E13 330R
3E14 330R
3E15 330R

2E04 1u0
2E05 1u0
2E06 1u0
IE35 IE36 IE37

3E16 330R
3E17 330R
3E18 330R

+5VSWI

5E01
FE06
2E16 100n
2E17 100n
2E18 100n
2E19 100n
2E20 47u 6.3V

7E01 SM5301BS-G
VCC Φ VCC
DISABLE
THROUGH
MUXSEL
GSR1
RINA|YINA
RINB|YINB
GSG1
GINA|UINA
GINB|UINB
GSB1
BINA|VINB
BINB|VINB
RFC
VFC
GND GND_HS
NC1 NC2 NC3
ROUT|YOUT
GOUT|UOUT
BOUT|VOUT

17 R-PR-ADC
14 G-Y-ADC
11 B-PB-ADC

B7 FROM SCALER
B7 TO SCALER

B2 TO HERCULES

0V I_PC_HD_SEL
4E03 RES
3V2 SD_HD_SEL

(SCART) (CINCH)
B15/B23 FROM ANALOG-IO

SC1_CVI_DMMI_R_Pr_IN IE13
SC1_CVI_DMMI_G_Y_IN IE14
SC1_CVI_DMMI_B_Pb_IN IE15

2E00 4u7
2E01 4u7
2E02 4u7

3E09 47K
3E10 47K
3E11 47K

3E50 47K
3E51 47K
3E52 47K
3E06 47K
3E07 47K
3E08 47K

+5VSWI
5E00 IE00 2E03 100n

7E00 ADG733BRU
VDD Φ EN
A0 A1 A2
S1A S1B S2A S2B S3A S3B
D1 D2 D3
VSS GND

3E12 10K
RGB|CVI_HDA_SEL FE03

RINA|Pr 2E33 4u7 IE16
GINA|YINA 2E34 4u7
BINA|Pb 2E35 4u7 IE18

FROM DIGITAL-IO
B14/B22 (SCART) (CINCH)

3E53 47K
3E54 47K
3E55 47K

SC1_R_CVI_Pr_IN IE19
SC1_G_CVI_Y_IN
SC1_B_CVI_Pb_IN IE21

4E12 RES
4E13 RES
4E14 RES

B8 TO SCALER

HD_FILTER IE03 0V
3E22 100K

3E19 56R IE25 2E08 4u7 2E07 33p
3E20 56R IE26 2E10 4u7 2E09 33p
3E21 56R 2E12 4u7 2E11 33p

IE22 IE23 IE04 FE05
2E13 1u0 2E14 33p 3E23 820R

2E21 4u7 IE05
2E22 4u7 IE06
2E23 4u7 IE07

2E37 15p
2E38 15p
2E39 15p

+5VSWI 5E02 IE08 2E15 100n

7E02 ADG781BCP
5V4
VDD Φ
SPST SWITCH
NC NC
S1 S2 S3 S4
D1 D2 D3 D4
GND_HS GND
IN1 IN2 IN3 IN4
0V6 2V7 0V8 2V7 0V4 2V7

PC_HD_SEL 3V2
FE08 3V3

FE09 3E24 470R 2E24 100n IE33 SOG

FE10 3E25 39R 2E25 100n R_PR+
FE11 3E26 22R 2E26 100n R_PR-
FE12 3E27 39R 2E27 100n G_Y+
3E28 22R 2E28 100n G_Y-
FE13 3E29 39R 2E29 100n B_PB+
3E30 22R 2E30 100n B_PB-
IE32 IE34

B3 SYNC INTERFACE

Hsync_SDTV 3E31 100R IE09
H_PC 3E32 100R IE10
Vsync_SDTV 3E33 100R IE11
V_PC 3E34 100R IE12

BZX384-C2V7 6E00 6E01 6E02 6E03

FROM DIGITAL-IO
B14/B22 (SCART) (CINCH)

+3V3SW 5E03 2E31 100n

7E03 74HC4053D
VDD MDX VEE_VSS
4X1 4X2
4E10 RES
4E11 RES

B18 FROM ADC

COL_Di(8) 3E37 22R
COL_Di(8)_INV
COL_Do(8)
COL_Do(8)_INV

7E04-1 74LVC14APW
7E04-2 74LVC14APW
7E04-3 74LVC14APW
7E04-4 74LVC14APW
7E04-5 74LVC14APW
7E04-6 74LVC14APW

3E35 100R
3E36 100R
3E38 100R
3E39 100R
3E49 22R

IE27 AHSYNC
IE24 AVSYNC
IE28

B12

B19

B12 FROM HDMI

V_HDMI 3E41 100R
H_HDMI 3E42 100R
3E43 100R
3E44 100R
3E45 100R
3E46 100R (NC)

7E05-1 74LVC14APW
7E05-2 74LVC14APW
7E05-3 74LVC14APW
7E05-4 74LVC14APW
7E05-5 74LVC14APW
7E05-6 74LVC14APW

IE31 HDMI_VVS
HDMI_VHS

I_PC_HD_SEL

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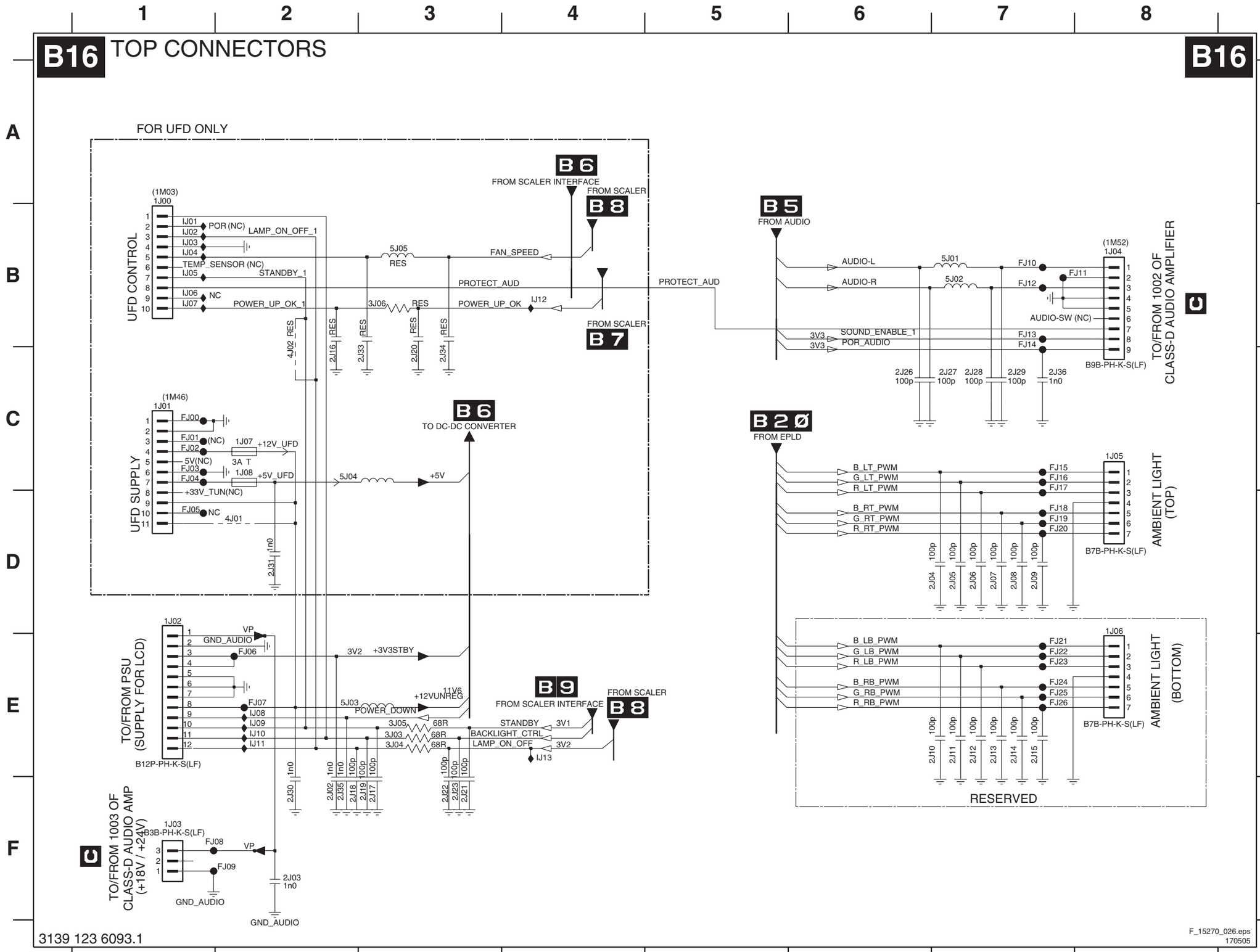
2E00 C2	3E50 C3	IE34 D10
2E01 C2	3E51 C3	IE35 B7
2E02 C2	3E52 C3	IE36 B7
2E03 B5	3E53 D3	IE37 B7
2E04 B7	3E54 D3	
2E05 B7	3E55 D3	
2E06 B7	4E03 B6	
2E07 C7	4E10 E2	
2E08 C7	4E11 G3	
2E09 C7	4E12 D5	
2E10 C7	4E13 D5	
2E11 D7	4E14 D5	
2E12 D7	5E00 B4	
2E13 D7	5E01 B8	
2E14 D7	5E02 A10	
2E15 A10	5E03 E3	
2E16 B8	6E00 F2	
2E17 B8	6E01 F2	
2E18 B8	6E02 F2	
2E19 B8	6E03 F2	
2E20 B8	7E00 B4	
2E21 A9	7E01 B8	
2E22 B9	7E02 A10	
2E23 B9	7E03 E3	
2E24 C10	7E04-1 E5	
2E25 C10	7E04-2 E6	
2E26 C10	7E04-3 F5	
2E27 C10	7E04-4 F6	
2E28 C10	7E04-5 G5	
2E29 D10	7E04-6 G6	
2E30 D10	7E05-1 E9	
2E31 E3	7E05-2 E10	
2E32 E6	7E05-3 F9	
2E33 C2	7E05-4 F10	
2E34 C2	7E05-5 G9	
2E35 D2	7E05-6 G10	
2E36 E10	FE00 B2	
2E37 B9	FE01 B2	
2E38 B9	FE02 B2	
2E39 B9	FE03 C5	
3E00 A2	FE04 C7	
3E01 A2	FE05 D7	
3E02 A2	FE06 B8	
3E06 C3	FE07 D8	
3E07 C3	FE08 B11	
3E08 C3	FE09 C9	
3E09 C3	FE10 C9	
3E10 C3	FE11 C9	
3E11 C3	FE12 C9	
3E12 C5	FE13 D9	
3E13 B6	IE00 B4	
3E14 B6	IE01 B7	
3E15 B6	IE02 B7	
3E16 B6	IE03 D6	
3E17 B6	IE04 D7	
3E18 B7	IE05 A9	
3E19 C6	IE06 B9	
3E20 C6	IE07 B9	
3E21 D6	IE08 A10	
3E22 D6	IE09 E2	
3E23 D7	IE10 F2	
3E24 C10	IE11 F2	
3E25 C10	IE12 F2	
3E26 C10	IE13 C3	
3E27 C10	IE14 C3	
3E28 C10	IE15 C3	
3E29 D10	IE16 C3	
3E30 D10	IE17 A10	
3E31 E2	IE18 D2	
3E32 F2	IE19 C6	
3E33 F2	IE20 C7	
3E34 F2	IE21 D6	
3E35 E5	IE22 C7	
3E36 F5	IE23 D7	
3E37 G4	IE24 F7	
3E38 F6	IE25 C7	
3E39 E6	IE26 C7	
3E41 E9	IE27 E7	
3E42 F9	IE28 G6	
3E43 G9	IE29 A10	
3E44 E11	IE30 A10	
3E45 F11	IE31 E11	
3E46 G11	IE32 C10	
3E49 G5	IE33 C11	

SSB: Top Connectors

B16 TOP CONNECTORS



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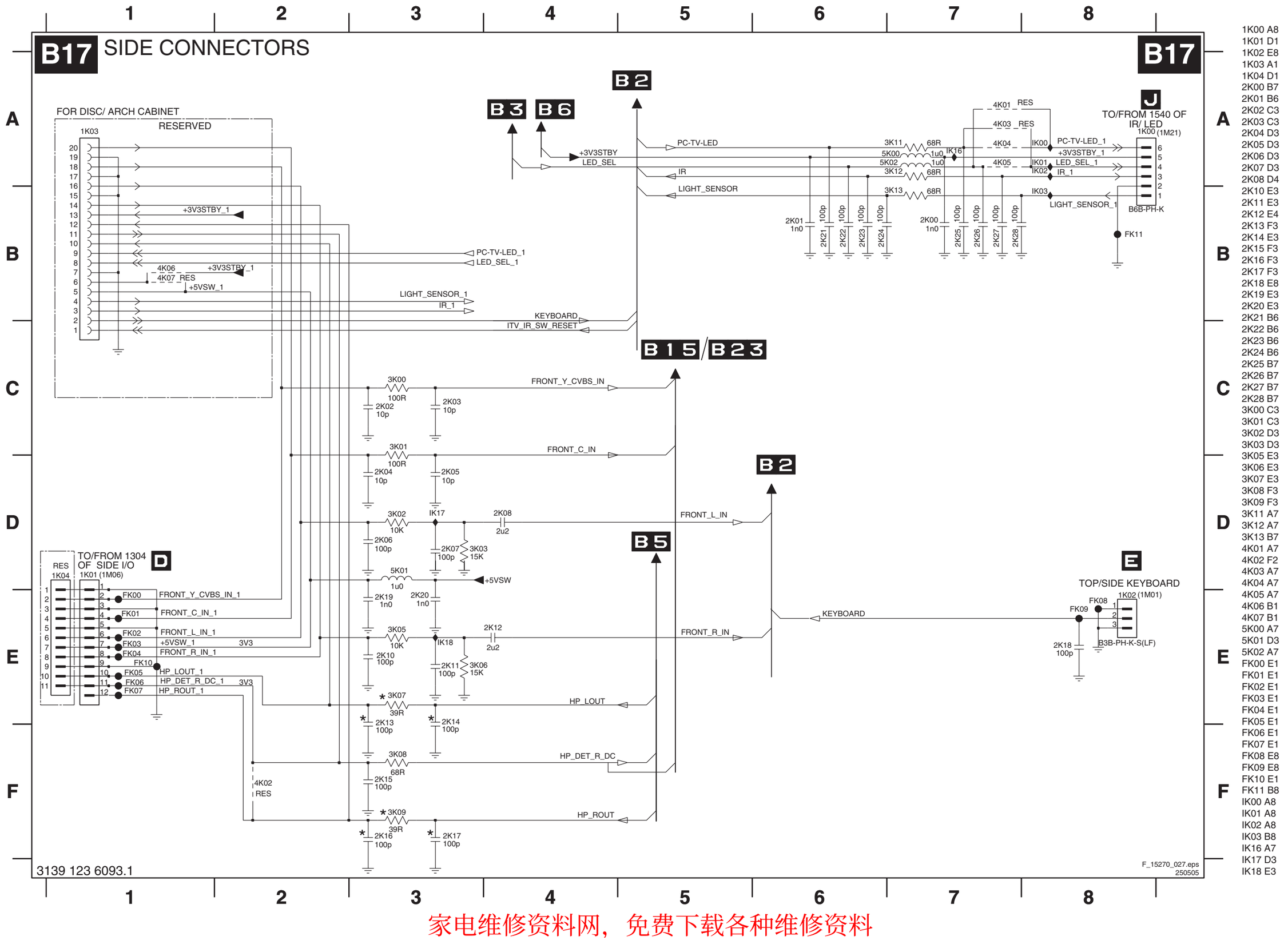
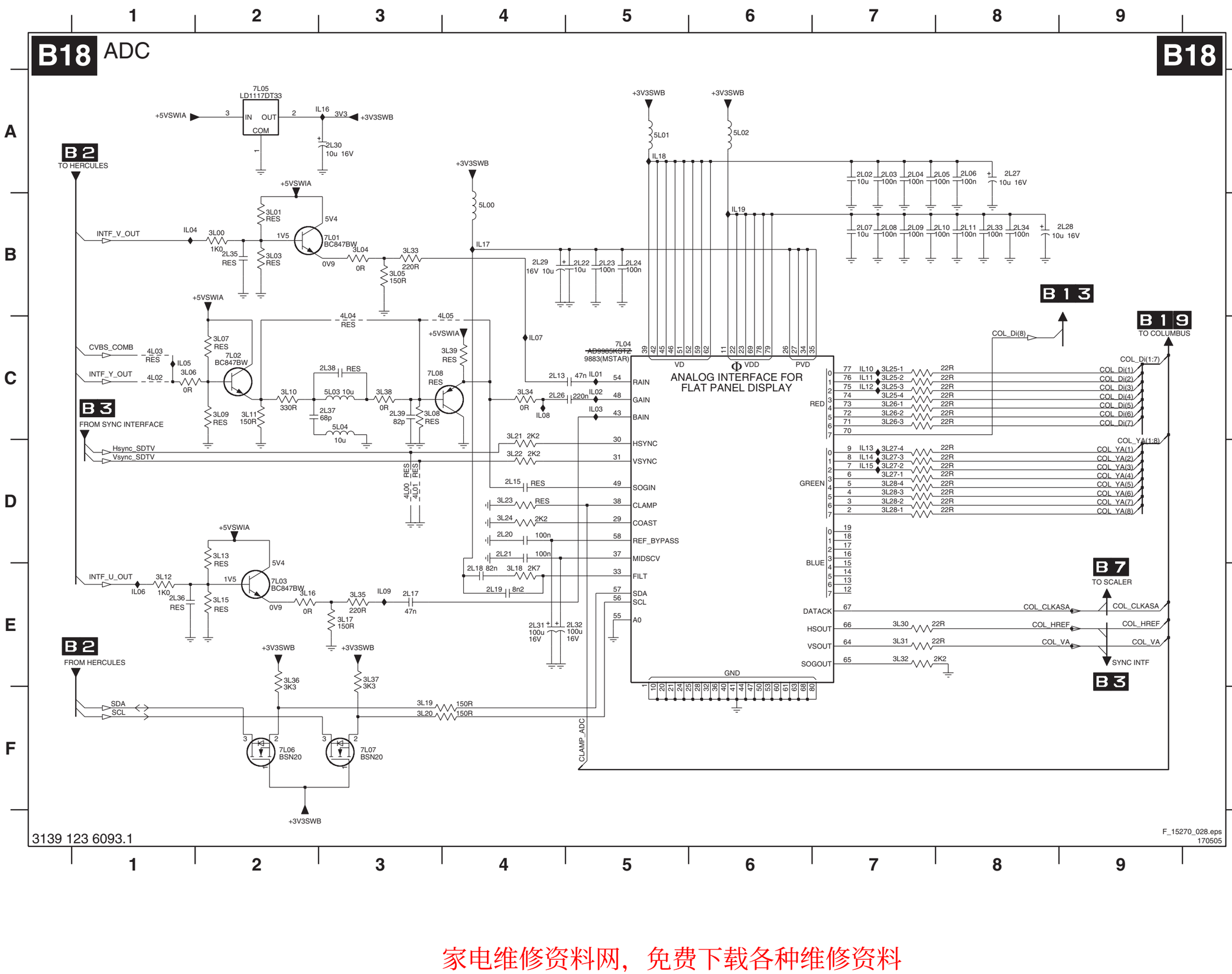
1J00 B1	FJ25 E7
1J01 C1	FJ26 E7
1J02 D1	IJ01 B1
1J03 F1	IJ02 B1
1J04 B8	IJ03 B1
1J05 C8	IJ04 B1
1J06 E8	IJ05 B1
1J07 C2	IJ06 B1
1J08 C2	IJ07 B1
2J02 F2	IJ08 E2
2J03 F2	IJ09 E2
2J04 D6	IJ10 E2
2J05 D7	IJ11 E2
2J06 D7	IJ12 B4
2J07 D7	IJ13 E4
2J08 D7	
2J09 D7	
2J10 E6	
2J11 E7	
2J12 E7	
2J13 E7	
2J14 E7	
2J15 E7	
2J16 C2	
2J17 F3	
2J18 F2	
2J19 F3	
2J20 C3	
2J21 F3	
2J22 F3	
2J23 F3	
2J26 C6	
2J27 C7	
2J28 C7	
2J29 C7	
2J30 F2	
2J31 D2	
2J33 C2	
2J34 C3	
2J35 F2	
2J36 C7	
3J03 E3	
3J04 E3	
3J05 E3	
3J06 B3	
4J01 D2	
4J02 C2	
5J01 B7	
5J02 B7	
5J03 E2	
5J04 C2	
5J05 B3	
FJ00 C1	
FJ01 C1	
FJ02 C1	
FJ03 C1	
FJ04 C1	
FJ05 D1	
FJ06 E2	
FJ07 E2	
FJ08 F1	
FJ09 F2	
FJ10 B7	
FJ11 B8	
FJ12 B7	
FJ13 B7	
FJ14 C7	
FJ15 C7	
FJ16 C7	
FJ17 D7	
FJ18 D7	
FJ19 D7	
FJ20 D7	
FJ21 E7	
FJ22 E7	
FJ23 E7	
FJ24 E7	

SSB: Side Connectors



1K00 A8
1K01 D1
1K02 E8
1K03 A1
1K04 D1
2K00 B7
2K01 B6
2K02 C3
2K03 C3
2K04 D3
2K05 D3
2K06 D3
2K07 D3
2K08 D4
2K10 E3
2K11 E3
2K12 E4
2K13 F3
2K14 E3
2K15 F3
2K16 F3
2K17 F3
2K18 E8
2K19 E3
2K20 E3
2K21 B6
2K22 B6
2K23 B6
2K24 B6
2K25 B7
2K26 B7
2K27 B7
2K28 B7
3K00 C3
3K01 C3
3K02 D3
3K03 D3
3K05 E3
3K06 E3
3K07 E3
3K08 F3
3K09 F3
3K11 A7
3K12 A7
3K13 B7
4K01 A7
4K02 F2
4K03 A7
4K04 A7
4K05 A7
4K06 B1
4K07 B1
5K00 A7
5K01 D3
5K02 A7
FK00 E1
FK01 E1
FK02 E1
FK03 E1
FK04 E1
FK05 E1
FK06 E1
FK07 E1
FK08 E8
FK09 E8
FK10 E1
FK11 B8
IK00 A8
IK01 A8
IK02 A8
IK03 B8
IK16 A7
IK17 D3
IK18 E3

SSB: ADC



2L02	A7	3L37	E3
2L03	A7	3L38	C3
2L04	A7	3L39	C4
2L05	A8	4L00	D3
2L06	A8	4L01	D3
2L07	B7	4L02	C1
2L08	B7	4L03	C1
2L09	B7	4L04	C3
2L10	B8	4L05	C4
2L11	B8	5L00	B4
2L13	C4	5L01	A5
2L15	D4	5L02	A6
2L17	E3	5L03	C3
2L18	E4	5L04	C3
2L19	E4	7L01	B3
2L20	D4	7L02	C2
2L21	D4	7L03	E2
2L22	B5	7L04	C5
2L23	B5	7L05	A2
2L24	B5	7L06	F2
2L26	C4	7L07	F3
2L27	A8	7L08	C3
2L28	B9	IL01	C5
2L29	B4	IL02	C5
2L30	A3	IL03	C5
2L31	E4	IL04	B1
2L32	E5	IL05	C1
2L33	B8	IL06	E1
2L34	B8	IL07	C4
2L35	B2	IL08	C4
2L36	E1	IL09	E3
2L37	C3	IL10	C7
2L38	C3	IL11	C7
2L39	C3	IL12	C7
3L00	B2	IL13	D7
3L01	B2	IL14	D7
3L03	B2	IL15	D7
3L04	B3	IL16	A3
3L05	B3	IL17	B4
3L06	C1	IL18	A5
3L07	C2	IL19	B6
3L08	C3		
3L09	C2		
3L10	C2		
3L11	C2		
3L12	E1		
3L13	D2		
3L15	E2		
3L16	E2		
3L17	E3		
3L18	E4		
3L19	F3		
3L20	F3		
3L21	C4		
3L22	D4		
3L23	D4		
3L24	D4		
3L25-1	C7		
3L25-2	C7		
3L25-3	C7		
3L25-4	C7		
3L26-1	C7		
3L26-2	C7		
3L26-3	C7		
3L27-1	D7		
3L27-2	D7		
3L27-3	D7		
3L27-4	D7		
3L28-1	D7		
3L28-2	D7		
3L28-3	D7		
3L28-4	D7		
3L30	E7		
3L31	E7		
3L32	E7		
3L33	B3		
3L34	C4		
3L35	E3		
3L36	E2		

SSB: Columbus

B19 COLUMBUS

B19

+3V3SW 5M03 3V2 +3V3SWA
2M65 100n 2M66 100u 16V
+5VSWI 5M04 5V3 +5VSWIA
2M67 100n 2M68 100u 16V

+3V3SWA 3M79 3K3 7M17 RES 3M00 RES
+3V3SWA 3M86 RES
3M87 0R
7M00-1 COLUMBUS
COLUMBUS_IO

B7 TO SCALER
COL_DE

COL_DQM L14
COL_RAS K15
COL_CAS K14
COL_CLK J14
COL_WE J15
4M00 4M01 4M02 4M03
COL_A0 P6
COL_A1 R6
COL_A2 P5
COL_A3 R5
COL_A4 R1
COL_A5 R2
COL_A6 R3
COL_A7 P3
COL_A8 R4
COL_A9 P4
COL_A10 R7
COL_A11 P7

DQM RAS_ CAS_ CLK WE_
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11
Memory Interface
DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15 DQ16

P12 R12 P11 P10 R10 P9 P8 R8 R13 R14 R15 P15 M14 M15 L15
3M01-1 3M01-2 3M01-3 3M01-4 3M02-1 3M02-2 3M02-3 3M02-4 3M03-4 3M03-3 3M03-2 3M03-1 3M04-4 3M04-3 3M04-2 3M04-1
68R
COL_DQ1 COL_DQ2 COL_DQ3 COL_DQ4 COL_DQ5 COL_DQ6 COL_DQ7 COL_DQ8 COL_DQ9 COL_DQ10 COL_DQ11 COL_DQ12 COL_DQ13 COL_DQ14 COL_DQ15 COL_DQ16

COL_CLKASA 3M89 22R H1 B13
CLKASA WEA / DAVA
CLKASB WEB / DAVB
G1 A1 3M88 22R COL_CLKASB IM10 IM00

COL_YA(1:8)
3M26 0R IM03 IM04 IM06 IM07 B7 B9 A9 B10
COL_YA(1) A10
COL_YA(2) B11
COL_YA(3) A11
COL_YA(4) B12
COL_YA(5) A12
COL_YA(6)
COL_YA(7)
COL_YA(8)
YA0 / Di9 YA1 YA2 YA3 YA4 YA5 YA6 YA7 YA8
3D Comb
SWAN 3D Noise Reduct
MUX
656 Decod
656 Encod
YB0 / Do9 YB1 YB2 YB3 YB4 YB5 YB6 YB7 YB8
G2 F2 E2 E1 D2 D1 C2 C1 B1
3M28 3M06-1 3M06-2 3M06-3 3M06-4 3M07-1 3M07-2 3M07-3 3M07-4
RES 22R
COL_YB(1) COL_YB(2) COL_YB(3) COL_YB(4) COL_YB(5) COL_YB(6) COL_YB(7) COL_YB(8)

COL_VA A13
COL_HREF A14
VA HREF

COL_Di(1:7)
3M27 0R IM08 A2
COL_Di(1) B3
COL_Di(2) A3
COL_Di(3) B4
COL_Di(4) A4
COL_Di(5) B5
COL_Di(6) A5
COL_Di(7) B6
COL_Di(8)_INV 3M90 22R A6
UVA0 / Di0 UVA1 / Di1 UVA2 / Di2 UVA3 / Di3 UVA4 / Di4 UVA5 / Di5 UVA6 / Di6 UVA7 / Di7 UVA8 / Di8
UVB0 / Do0 UVB1 / Do1 UVB2 / Do2 UVB3 / Do3 UVB4 / Do4 UVB5 / Do5 UVB6 / Do6 UVB7 / Do7 UVB8 / Do8
M2 M1 L2 L1 K2 K1 J2 J1 H2
3M29 3M08-1 3M08-2 3M08-3 3M08-4 3M09-1 3M09-2 3M09-3
RES 22R
COL_Do(1) COL_Do(2) COL_Do(3) COL_Do(4) COL_Do(5) COL_Do(6) COL_Do(7)
COL_Do(8)

FROM ADC B18
B13
B13
B3

7M03 LF15ABDT
OUT IN COM
1V5 IM09 5M00 +3V3SWA
IM01 3V2
2M22 100n 2M23 100u 16V
5M01

B11 FROM FLASH/ CONTROL
B7 FROM SCALER
COL_RST 4M17
#RESET
7M00-2 COLUMBUS
COLUMBUS_CTRL
RESET CLKSEL CLKEXT A0IIC 656SEL TCK TDI TDO TMS TRST TST1 TST2 TST3 BISTEN
G15 H15 H14 G14 A7 D15 F15 E15 E14 F14 A8 F1 H3 B8
4M04 RES 4M05 4M06 RES 4M16
3M10 RES 3M11 4K7
2M33 100p
10K 10K 3M56 3M52 3M50
FM01 FM02 FM03 FM04 FM05 3M53 3M54 3M55 3M57 3M59 47R
3M58 10K 3M51 10K
3M12 RES 3M13 4K7
VDDS VDDC VSS
AVD AVS SNDA SNCL SNRST SDA SCL NC_2 NC_3
N1 P1 C14 D14 C15 A15 B15 D4 N2
IM11 2M24 100n
3M78 1K0 +3V3SWA
4M08 4M09
3M14 100R SDA
3M15 100R SCL
B2 FROM HERCULES

B3 TO/FROM SYNC INTERFACE
Hsync_SDTV
7M14-1 74HCT221D
7M14-2 74HCT221D
7M15-1 74HCT221D
VCC 1Jt GND
3M68 15K 3M69 10K 3M71 2K7
2M60 1n0 2M61 1n0 2M62 1n0
H_DELAY
CLAMP_ADC
TO ADC B18

5M05 +3V3SWA
2M32 100u 16V 2M25 2M26 2M27 2M28 2M29 2M30 100n
7M01 VDD VDDQ
DRAM 512K X 16 X 2
MSM56V16160F-7T3
512K-1
COL_A0 COL_A1 COL_A2 COL_A3 COL_A4 COL_A5 COL_A6 COL_A7 COL_A8 COL_A9 COL_A10 COL_A11
COL_CLK COL_RAS COL_CAS COL_WE
3M16 4K7
CLK CKE CS RAS CAS WE
DQM
COL_DQ1 COL_DQ2 COL_DQ3 COL_DQ4 COL_DQ5 COL_DQ6 COL_DQ7 COL_DQ8 COL_DQ9 COL_DQ10 COL_DQ11 COL_DQ12 COL_DQ13 COL_DQ14 COL_DQ15 COL_DQ16
COL_DQM
4M10
VSS VSSQ

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2M00 E2 2M01 E2 2M02 E3 2M03 E3 2M04 E3 2M05 E3 2M06 E3 2M07 E3 2M08 E3 2M09 E4 2M10 E4 2M11 E5 2M12 E5 2M13 E6 2M14 E6 2M15 E6 2M16 E6 2M17 E6 2M18 E7 2M19 E7 2M20 E7 2M21 E7 2M22 E8 2M23 E8 2M24 F7 2M25 A9 2M26 A10 2M27 A10 2M28 A10 2M29 A11 2M30 A11 2M31 E4 2M32 A9 2M33 F3 2M56 E7 2M60 F9 2M61 F11 2M62 G9 2M65 A2 2M66 A2 2M67 B2 2M68 B2 3M00 A4 3M01-1 B7 3M01-2 B7 3M01-3 B7 3M01-4 B7 3M02-1 B7 3M02-2 B7 3M02-3 B7 3M02-4 B7 3M03-1 B7 3M03-2 B7 3M03-3 B7 3M03-4 B7 3M04-1 C7 3M04-2 C7 3M04-3 C7 3M04-4 C7 3M06-1 C7 3M06-2 C7 3M06-3 C7 3M06-4 C7 3M07-1 C7 3M07-2 D7 3M07-3 D7 3M07-4 D7 3M08-1 D7 3M08-2 D7 3M08-3 D7 3M08-4 D7 3M09-1 D7 3M09-2 D7 3M09-3 E7 3M10 F3 3M11 F3 3M12 G3 3M13 H3 3M14 G7 3M15 G7 3M16 C9 3M26 C4 3M27 D4 3M28 C7 3M29 D7 3M50 G3 3M51 G3 3M52 G3 3M53 G2 3M54 G2 3M55 G2 3M56 G2 3M57 G2 3M58 G2 3M59 G2 3M68 E9 3M69 E11 3M71 F9 3M78 F7 3M79 A5 3M86 A6
3M87 A5 3M88 C8 3M89 C5 3M90 E4 4M00 B5 4M01 B5 4M02 B5 4M03 B5 4M04 F3 4M05 F3 4M06 F3 4M08 F7 4M09 F7 4M10 D10 4M16 F3 4M17 F3 5M00 E8 5M01 F7 5M02 E2 5M03 A2 5M04 A2 5M05 A10 7M00-1 A7 7M00-2 F4 7M01 B11 7M03 E8 7M14-1 E10 7M14-2 E11 7M15-1 F10 7M17 A4 FM01 G2 FM02 G2 FM03 G2 FM04 G2 FM05 G2 IM00 C8 IM01 E7 IM03 C5 IM04 C5 IM06 C5 IM07 C5 IM08 D5 IM09 E8 IM10 C8 IM11 F7

SSB: EPLD

B20 EPLD

B20

+3V3-IO
+3V3SW
7N01 EPCS4SI8
SCD
7N02-1 EP1C12F256C8
CONTROL
7N02-2 EP1C12F256C8
BANK 1
7N02-5 EP1C12F256C8
BANK 4
CONTROL SIGNALS
7N03-1 BC847BS
7N03-2 BC847BS
7N04 THC63LVDF84B
LCD PANEL INTERFACE RECEIVER
LVDS IN
FOR DEBUGGING
1N01 RES
1N02 B4B-PH-SM4-TBT(LF)
1N03 BM05B-SRSS-TBT RES
1N05 14M31818
OC
TLMG3100
B21 TO EPLD
B9 TO SCALER INTERFACE
B7 TO SCALER
B16 TO TOP CONN.
FOR NON-PIXEL+ SETS
FOR DEVELOPMENT USE ONLY
LVDS_PWR_DWN
PIXEL+_RESET
BACKLIGHT_DIM
CLK_REF
LED_OUT
SDA_IO
SCL_IO
CLKUSR
INIT_DONE

1N01 A9	7N02-2 D7
1N02 D11	7N02-5 D10
1N03 F12	7N03-1 C3
1N05 D5	7N03-2 C2
2N01 A2	7N04 D5
2N02 C1	FN01 B4
2N03 C2	FN02 B6
2N04 C2	FN03 C5
2N05 D4	FN04 A8
2N06 D4	FN05 B8
2N07 D5	FN06 B8
2N08 D5	FN07 B8
2N09 D5	FN08 B8
2N10 D6	FN09 B8
2N11 B7	FN10 B8
2N12 B7	FN11 D5
2N13 B7	FN12 E5
2N14 B7	FN13 E5
2N15 B8	FN14 F5
2N16 E11	FN15 F5
2N17 F11	FN16 F5
2N18 F11	FN17 G5
2N19 F11	FN18 D9
2N20 F11	FN19 D9
3N01 A3	FN20 F9
3N02 A3	FN21 F11
3N03 A3	FN22 F11
3N04 A3	FN23 F11
3N05 A3	FN24 F12
3N06 A3	FN25 F4
3N07 C2	FN26 D2
3N08 C2	FN27 D2
3N09 B4	FN28 D2
3N10 C2	FN29 D2
3N11 C4	FN30 D2
3N12 A5	FN31 D2
3N13 A5	FN32 D2
3N14 A5	FN33 D3
3N15 B6	FN34 D3
3N16 B6	FN35 D3
3N17 B6	IN01 B3
3N18 B6	IN02 B3
3N19 C5	IN03 B3
3N20 C5	IN04 B3
3N21 E3	IN05 B3
3N22 E3	IN06 C2
3N23 E3	IN07 D4
3N24 F3	IN08 C2
3N25 F3	IN09 C2
3N26 D4	IN10 B3
3N27 D6	IN11 B4
3N28 F8	IN12 C5
3N29 E11	IN13 D5
3N30 E11	IN14 D4
3N31 E11	IN15 D11
3N32 E11	IN16 D11
3N33 E11	IN17 D11
3N34 E11	IN18 D11
3N35 E11	IN19 F9
3N36 E11	
3N37 E11	
3N38 F11	
3N39 F11	
3N40 F11	
3N41 F11	
3N42 F11	
3N43 F11	
3N44 F11	
3N45 F11	
3N46 D10	
3N47 D10	
4N01 D2	
4N02 D2	
4N03 D2	
4N04 D2	
4N05 D2	
4N06 D2	
4N07 D2	
4N08 D2	
4N09 D2	
4N10 D2	
4N11 D2	
4N12 D2	
4N13 D2	
4N14 D2	
4N15 D3	
4N16 D3	
4N17 D3	
4N18 D3	
4N19 D3	
4N20 D3	
4N21 D9	
4N22 D9	
5N01 A8	
5N02 D4	
5N03 D4	
5N04 D5	
5N05 C6	
6N01 F9	
7N01 A2	
7N02-1 A4	

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SSB: EPLD

B21 EPLD

B21

EAGLE INTERFACE
7N02-3
EP1C12F256C8
BANK 2

7N02-6
EP1C12F256C8
POWER

LVDS TRANSMITTER
+3V3SW
7P02
THC63LVDM83R

LVDS OUT
7N02-4
EP1C12F256C8
BANK 3

FOR MFD ONLY
TO LCD PANEL (TIMING CONTROL)
0-1453230-3

FOR UFD ONLY
TO PLASMA PANEL (TIMING CONTROL)
FI-WE31P-HFE-E1500

B20 (H=NORMAL)
LVDS_PWR_DWN
CLK_OUT
PARITY_OUT
HS_OUT
VS_OUT
DE_OUT

B 9 FROM SCALER INTERFACE
B 2 0 FROM EPLD
B 6 FROM DC-DC CONVERTER
FOR LCD ONLY

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1P01 E8
1P02 E8
1P03 F8
1P04 F8
1P05 G8
1P06 A11
1P07 D11
2P01 B3
2P02 B3
2P03 B3
2P04 B3
2P05 B3
2P06 B3
2P07 B4
2P08 B4
2P09 B4
2P10 B4
2P11 B4
2P12 B4
2P13 B4
2P14 B5
2P15 B1
2P16 B1
2P17 B2
2P18 B3
2P19 B3
2P20 B3
2P21 B3
2P22 C3
2P23 C3
2P24 C3
2P25 C3
2P26 C3
2P27 C3
2P28 C4
2P29 C4
2P30 C4
2P31 C5
2P32 D5
2P33 D5
2P34 D6
2P35 D7
2P36 D8
2P37 E8
2P38 E8
2P39 E8
2P40 F8
2P41 F8
2P42 F8
2P43 F8
2P44 G8
2P45 G8
3P01 D5
3P03 E5
3P04 D9
3P05 D9
4P01 F10
4P02 F10
4P03 F10
4P04 F10
4P05 F10
4P06 F10
4P07 F10
4P08 F10
4P09 D9
4P10 E9
5P01 A3
5P02 B3
5P03 C3
5P04 D6
5P05 D6
5P06 D7
7N02-3 A6
7N02-4 E2
7N02-6 A8
7P01 B2
7P02 D7
FP01 A1
FP02 A4
FP03 B2
FP04 B3
FP05 C4
FP06 D4
FP07 E4
FP08 E4
FP09 E4
FP10 F4
FP11 F4
FP12 F4
FP13 F4
FP14 G4
FP15 D11
FP16 D11
FP17 E11

SSB: Diversity Tables B9-B21

B9 MUX-SYNC INTERFACE

Item	LC4.3x	LC4.8x	LC4.9x	Description
2A00			V	CER2 0603 X7R 16V 100N COL
2A01			V	CER1 0402 NP0 50V 100P COL
2A02			V	CER1 0402 NP0 50V 100P COL
2A03		V		CER2 0603 Y5V 10V 1U COL
2A12		V	V	CER2 0402 X7R 16V 10N COL
2A13		V	V	CER2 0402 Y5V 16V 100N COL
3A00			V	RST SM 0402 68R PM5 COL
3A01			V	RST SM 0402 68R PM5 COL
3A02	V	V		RST SM 0402 1K PM5 COL
3A06		V		RST SM 0603 10K PM5COL
3A06	V			RST SM 0603 JUMP. 0R05 COL
3A07			V	RST SM 0402 10K PM5 COL
3A07				RST SM 0402 68R PM5 COL
3A08			V	RST SM 0402 10K PM5 COL
3A10		V	V	RST SM 0402 10K PM5 COL
3A11		V	V	RST SM 0402 10K PM5 COL
3A13		V	V	RST SM 0402 10K PM5 COL
3A14		V	V	RST SM 0402 560R PM5 COL
4A03	V	V		RST SM 0603 JUMP. 0R05 COL
4A04			V	RST SM 0402 JUMP. 0R05 COL
4A05	V			RST SM 0402 JUMP. 0R05 COL
4A06	V			RST SM 0402 JUMP. 0R05 COL
5A00			V	FXDIND 0805 100MHZ 30R COL R
6A01		V	V	DIO REG SM BZX384-C3V9 COL R
7A00			V	IC SM PCA9515ADP (PHSE) R
7A02		V	V	TRA SIG SM BC847BW (COL) R
7A03		V	V	TRA SIG SM BC847BW (COL) R

B13 MUX-SYNC INTERFACE

ITEM	AP/EU/AP-DVB (with Teletext)	EU-DVB (with Teletext)	NAFTA/LT & China (non-Teletext)	DESCRIPTION
2E00	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E01	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E02	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E04	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E05	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E06	V	V		CER2 0402 X5R 6V3 1U PM20 R
3E06	V		V	RST SM 0402 47K PM5 COL
3E07	V		V	RST SM 0402 47K PM5 COL
3E08	V		V	RST SM 0402 47K PM5 COL
3E13	V	V		RST SM 0402 330R PM5 COL
3E14	V	V		RST SM 0402 330R PM5 COL
3E15	V	V		RST SM 0402 330R PM5 COL
3E16	V	V		RST SM 0402 330R PM5 COL
3E17	V	V		RST SM 0402 330R PM5 COL
3E18	V	V		RST SM 0402 330R PM5 COL

B15 ANALOG I/O SCART

Item	26/32PF	DVB.T 26/32PF	37/42PF	DVB.T 37/42PF	Description
1G01	V	V			SOC EURO H 21P F BK R-GRND B
1G01			V	V	SOC EURO H 21P F SHD R-GRND Y
1G02	V	V			SOC EURO H 21P F BK R-GRND B
1G02			V	V	SOC EURO H 21P F SHD R-GRND Y
1G03		V		V	CON H 32P F 0.50 SM FPC 0.3 R
2G29		V		V	ELCAP SM 16V 10U PM20 COL R
2G30		V		V	CER2 0603 X7R 16V 100N COL
2G31		V		V	CER2 0603 X7R 16V 100N COL
2G32				V	CER2 0603 Y5V 25V 100N COL
2G33		V		V	CER2 0603 Y5V 16V 220N COL
2G34		V		V	ELCAP SM 16V 10U PM20 COL R
2G35		V		V	CER2 0603 Y5V 25V 100N COL
2G36		V		V	CER2 0603 Y5V 10V 1U COL
2G37		V		V	RST SM 0603 330R PM5 COL
2G38		V		V	CER2 0603 Y5V 10V 1U COL
2G39		V		V	CER2 0603 Y5V 10V 1U COL
2G40		V		V	RST SM 0603 JUMP. 0R05 COL
2G41		V		V	RST SM 0603 330R PM5 COL
2G43		V		V	CER2 0603 X7R 50V 1N COL
2G45		V		V	CER2 0603 X7R 50V 1N COL
2G46		V		V	CER2 0603 X7R 50V 1N COL
2G63		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G64		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
3G63		V		V	RST SM 0603 10K PM5COL
3G64		V		V	RST SM 0603 10K PM5COL
3G65		V		V	RST SM 0603 10K PM5COL
3G66				V	RST SM 0603 150R PM5 COL
3G67		V		V	RST SM 0603 15K PM5 COL
3G68		V		V	RST SM 0603 15K PM5 COL
3G69		V		V	RST SM 0603 47K PM5 COL
3G70		V		V	RST SM 0603 47K PM5 COL
3G71		V		V	RST SM 0603 560R PM5 COL
3G72		V		V	RST SM 0603 10K PM5COL
3G73		V		V	RST SM 0603 47K PM5 COL
3G75		V		V	RST SM 0603 100R PM5 COL
3G76		V		V	RST SM 0603 100R PM5 COL
3G77		V		V	RST SM 0603 47K PM5 COL
3G79		V		V	RST SM 0603 47K PM5 COL
3G81		V		V	RST SM 0603 47K PM5 COL
3G83		V		V	RST SM 0603 100R PM5 COL
3G84		V		V	RST SM 0603 100R PM5 COL
3G86		V		V	RST SM 0603 47K PM5 COL
3G88		V		V	RST SM 0603 75R PM5 COL
3G89		V		V	RST SM 0603 47K PM5 COL
3G92		V		V	RST SM 0603 47K PM5 COL
3G93		V		V	RST SM 0603 47K PM5 COL
3G94		V		V	RST SM 0603 47K PM5 COL
3G95		V		V	RST SM 0603 47K PM5 COL
4G09		V		V	RST SM 0603 JUMP. 0R05 COL
4G11	V		V		RST SM 0603 JUMP. 0R05 COL
4G12	V		V		RST SM 0603 JUMP. 0R05 COL
4G13	V		V		RST SM 0603 JUMP. 0R05 COL
4G14	V		V		RST SM 0603 JUMP. 0R05 COL
4G15	V		V		RST SM 0603 JUMP. 0R05 COL
4G16	V		V		RST SM 0603 JUMP. 0R05 COL
4G17	V		V		RST SM 0603 JUMP. 0R05 COL
4G18	V		V		RST SM 0603 JUMP. 0R05 COL
4G19	V		V		RST SM 0603 JUMP. 0R05 COL
4G22		V		V	RST SM 0603 JUMP. 0R05 COL
5G01		V		V	FXDIND 0603 100MHZ 120R COL R
6G02		V		V	DIO SIG SM BAS316 (COL) R
7G07		V		V	IC SM 74HC4053D (PHSE) R
7G08		V		V	TRA SIG SM BC847B (COL) R
7G09		V		V	IC SM ADG734BRUZ (ANA0) R

B16 SIDE CONNECTORS

Item	LC4.3x - CINCH	LC4.3E - SCART	LC4.9x - PDP	LC4.8x - LCD	Description
1J00			V	V	CON V 10P M 2.00 PH B
1J01			V	V	CON V 11P M 2.00 PH B
1J02	V	V			CON V 12P M 2.00 PH B
1J03	V	V			CON V 3P M 2.00 PH B
1J07			V	V	FUSE SM T 3A 125V UL R
1J08			V	V	FUSE SM F 630MA 50V UL R
2J31			V	V	CER1 0402 NP0 50V 100P COL
3J03	V	V		V	RST SM 0402 68R PM5 COL
3J04	V	V		V	RST SM 0402 68R PM5 COL
4J01			V	V	RST SM 0402 JUMP. 0R05 COL
5J04			V	V	IND FXD 1206 EMI 100MHZ 120R R

B17 SIDE CONNECTORS

Item	LC4.3x - ME5 styling	LC4.3x - Arch Styling	LC4.8x - LCD	LC4.9x - PDP	Description
1K00	V		V	V	CON V 6P M 2.00 PH B
1K01	V				CON V 12P M 2.00 PH B
1K03		V			CON V 20P F 1.25 FFC 0.3 B
1K04			V	V	CON V 11P M 2.00 PH B
2K15	V	V			CER1 0402 NP0 50V 100P COL
3K08	V	V			RST SM 0402 68R PM5 COL
4K02			V	V	RST SM 0603 JUMP. 0R05 COL
4K06		V			RST SM 0402 JUMP. 0R05 COL
5K01	V	V		V	FXDIND SM 0603 1U PM10 COL R

B18 ADC

Item	non-DVB sets with 3D Comb Filter	DVB sets with 3D Comb Filter	Description
3L38		V	RST SM 0402 JUMP. 0R05 COL
4L05		V	RST SM 0402 JUMP. 0R05 COL
5L04		V	RST SM 0603 JUMP. 0R05 COL

B20 & B21 PIXEL PLUS

Item	LC4.3 non PIXEL+	LC4.3 with PIXEL+	42PF7320/28	LC4.8/LC4.9 non PIXEL+	LC4.8/LC4.9 with PIXEL+	Description
1N02		V	V		V	CON V 4P M 2.00 SM PH R
1N05		V	V		V	OSC XTL SM 14M31818 15P OC R
1P06	V	V				CON V 30P M 1.25 SM 1453230 R
1P07			V	V	V	CON H 31P F 1.25 SM FI-WE R
2N01		V	V		V	CER2 0402 Y5V 16V 100N COL
2N02		V	V		V	CER2 0402 Y5V 16V 100N COL
2N03		V	V		V	CER2 0402 X5R 6V3 1U PM20 R
2N04		V	V		V	CER2 0402 X7R 50V 1N COL
2N05		V	V		V	CER2 0402 Y5V 16V 100N COL
2N06		V	V		V	CER2 0402 Y5V 16V 100N COL
2N07		V	V		V	CER2 0402 Y5V 16V 100N COL
2N08		V	V		V	CER2 0402 Y5V 16V 100N COL
2N09		V	V		V	CER2 0402 Y5V 16V 100N COL
2N10		V	V		V	CER2 0402 Y5V 16V 100N COL
2N11		V	V		V	CER1 0402 NP0 50V 100P COL
2N12		V	V		V	CER1 0402 NP0 50V 100P COL
2N13		V	V		V	CER1 0402 NP0 50V 100P COL
2N14		V	V		V	CER1 0402 NP0 50V 100P COL
2N15		V	V		V	CER1 0402 NP0 50V 100P COL
2N16		V	V		V	CER1 0402 NP0 50V 100P COL
2P01		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P02		V	V		V	CER2 0402 Y5V 16V 100N COL
2P03		V	V		V	CER2 0402 Y5V 16V 100N COL
2P04		V	V		V	CER2 0402 Y5V 16V 100N COL
2P05		V	V		V	CER2 0402 Y5V 16V 100N COL
2P06		V	V		V	CER2 0402 Y5V 16V 100N COL
2P07		V	V		V	CER2 0402 Y5V 16V 100N COL
2P08		V	V		V	CER2 0402 Y5V 16V 100N COL
2P09		V	V		V	CER2 0402 Y5V 16V 100N COL
2P10		V	V		V	CER2 0402 Y5V 16V 100N COL
2P11		V	V		V	CER2 0402 Y5V 16V 100N COL
2P12		V	V		V	CER2 0402 Y5V 16V 100N COL
2P13		V	V		V	CER2 0402 Y5V 16V 100N COL
2P14		V	V		V	CER2 0402 Y5V 16V 100N COL
2P15		V	V		V	ELCAP SM 16V 100U PM20 COL R
2P16		V	V		V	CER2 0402 Y5V 16V 100N COL
2P17		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P18		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P19		V	V		V	CER2 0402 Y5V 16V 100N COL
2P20		V	V		V	CER2 0402 Y5V 16V 100N COL
2P21		V	V		V	CER2 0402 Y5V 16V 100N COL
2P22		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P23		V	V		V	CER2 0402 Y5V 16V 100N COL
2P24		V	V		V	CER2 0402 Y5V 16V 100N COL
2P25		V	V		V	CER2 0402 Y5V 16V 100N COL
2P26		V	V		V	CER2 0402 Y5V 16V 100N COL
2P27		V	V		V	CER2 0402 Y5V 16V 100N COL
2P28		V	V		V	CER2 0402 Y5V 16V 100N COL
2P29		V	V		V	CER2 0402 Y5V 16V 100N COL
2P30		V	V		V	CER2 0402 Y5V 16V 100N COL
2P31		V	V		V	CER2 0402 Y5V 16V 100N COL
2P32		V	V		V	CER2 0402 Y5V 16V 100N COL
2P33		V	V		V	CER2 0402 Y5V 16V 100N COL
2P34		V	V		V	CER2 0402 Y5V 16V 100N COL
2P35		V	V		V	CER2 0402 Y5V 16V 100N COL
3N01		V	V		V	RST SM 0402 10K PM5 COL
3N02		V	V		V	RST SM 0402 10K PM5 COL
3N03		V	V		V	RST SM 0402 10K PM5 COL
3N04		V	V		V	RST SM 0402 10K PM5 COL
3N05		V	V		V	RST SM 0402 10K PM5 COL
3N06		V	V		V	RST SM 0402 10K PM5 COL
3N07		V	V		V	RST SM 0603 33K PM5 COL
3N08		V	V		V	RST SM 0402 10K PM5 COL
3N09		V	V		V	RST SM 0402 1K PM5 COL
3N10		V	V		V	RST SM 0402 33K PM5 COL
3N11		V	V		V	RST SM 0402 47R PM5 COL
3N12		V	V		V	RST SM 0402 10K PM5 COL
3N13		V	V		V	RST SM 0402 10K PM5 COL
3N14		V	V		V	RST SM 0402 10K PM5 COL
3N15		V	V		V	RST SM 0402 47R PM5 COL
3N16		V	V		V	RST SM 0402 47R PM5 COL

Item	LC4.3 non PIXEL+	LC4.3 with PIXEL+	42PF7320/28	LC4.8/LC4.9 non PIXEL+	LC4.8/LC4.9 with PIXEL+	Description
3N17		V	V		V	RST SM 0402 47R PM5 COL
3N18		V	V		V	RST SM 0402 47R PM5 COL
3N19		V	V		V	RST SM 0402 10K PM5 COL
3N20		V	V		V	RST SM 0402 47R PM5 COL
3N21		V	V		V	RST SM 0402 100R PM5 COL
3N22		V	V		V	RST SM 0402 100R PM5 COL
3N23		V	V		V	RST SM 0402 100R PM5 COL
3N24		V	V		V	RST SM 0402 100R PM5 COL
3N25		V	V		V	RST SM 0402 100R PM5 COL
3N26		V	V		V	RST SM 0402 4K7 PM5 COL
3N27		V	V		V	RST SM 0402 47R PM5 COL
3N28		V	V		V	RST SM 0603 180R PM5 COL
3N29		V	V		V	RST SM 0402 100R PM5 COL
3N30		V	V		V	RST SM 0402 100R PM5 COL
3N31		V	V		V	RST SM 0402 100R PM5 COL
3N32		V	V		V	RST SM 0402 100R PM5 COL
3N33		V	V		V	RST SM 0402 100R PM5 COL
3N34		V	V		V	RST SM 0402 100R PM5 COL
3N35		V	V		V	RST SM 0402 100R PM5 COL
3N46		V	V		V	RST SM 0402 100R PM5 COL
3N47		V	V		V	RST SM 0402 100R PM5 COL
3P01		V	V		V	RST SM 0402 4K7 PM5 COL
3P03		V	V		V	RST SM 0402 47R PM5 COL
3P04				V		RST SM 0402 100R PM5 COL
3P04					V	RST SM 0402 JUMP. 0R05 COL
3P05				V		RST SM 0402 100R PM5 COL
3P05					V	RST SM 0402 JUMP. 0R05 COL
4N01	V			V		RST SM 0402 JUMP. 0R05 COL
4N02	V			V		RST SM 0402 JUMP. 0R05 COL
4N03	V			V		RST SM 0402 JUMP. 0R05 COL
4N04	V			V		RST SM 0402 JUMP. 0R05 COL
4N05	V			V		RST SM 0402 JUMP. 0R05 COL
4N06	V			V		RST SM 0402 JUMP. 0R05 COL
4N07	V			V		RST SM 0402 JUMP. 0R05 COL
4N08	V			V		RST SM 0402 JUMP. 0R05 COL
4N09	V			V		RST SM 0402 JUMP. 0R05 COL
4N10	V			V		RST SM 0402 JUMP. 0R05 COL
4N11	V			V		RST SM 0402 JUMP. 0R05 COL
4N12	V			V		RST SM 0402 JUMP. 0R05 COL
4N13	V			V		RST SM 0402 JUMP. 0R05 COL
4N14	V			V		RST SM 0402 JUMP. 0R05 COL
4N15	V			V		RST SM 0402 JUMP. 0R05 COL
4N16	V			V		RST SM 0402 JUMP. 0R05 COL
4N17	V			V		RST SM 0402 JUMP. 0R05 COL
4N18	V			V		RST SM 0402 JUMP. 0R05 COL
4N19	V			V		RST SM 0402 JUMP. 0R05 COL
4N20	V			V		RST SM 0402 JUMP. 0R05 COL
4N21		V	V		V	RST SM 0402 JUMP. 0R05 COL
4N22		V	V		V	RST SM 0402 JUMP. 0R05 COL
4P01						RST SM 0402 JUMP. 0R05 COL
4P02						RST SM 0402 JUMP. 0R05 COL
4P07				V		RST SM 0402 JUMP. 0R05 COL
5N01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P06		V	V		V	FXDIND 0805 100MHZ 30R COL R
6N01		V	V		V	LED VS SM TLMG3100 (VISH) R
7N01		V	V		V	IC SM EPCS4SI8N (ALT0) R
7N02		V	V		V	IC SM EP1C12F256C8N (ALT0) Y
7N03		V	V		V	TRA SIG SM BC847BS (PHSE) R
7N04		V	V		V	IC SM THC63LVDF84B (THIN) R
7P01		V	V		V	IC SM LF15ABDT (ST00) R
7P02		V	V		V	IC SM THC63LVDM83R (THIN) R

F_15270_070.eps
240505

SSB: Digital I/O

B22 DIGITAL IO

AV3: VGA + 2fHYPbPr

VGA Connector

1Q01 T285-15S-064-98F

FQ01 FQ02 FQ03 FQ04 FQ05 FQ06 FQ07 FQ08 FQ09 FQ10

SDA_VGA SCL_VGA

3Q16 150R 2Q16 100n IQ01 6Q16 BAS316 IQ02 5Q16 DDC_5V

3Q17 1K0 IQ03 3Q18 10K +5VSWI

2Q17 330p 2Q18 330p

5Q01 2Q01 RES 3Q01 75R RINA|Pr B13

5Q06 2Q06 RES 3Q06 75R GINA|YINA B13

5Q11 2Q11 RES 3Q11 75R BINA|Pb B13

5Q21 3Q21 2K2 3Q22 220R 2Q21 100p IQ23 H_PC B13

5Q23 3Q23 2K2 3Q24 220R 2Q23 100p IQ21 V_PC B13

B13 TO PCHD-MUX

B7 TO SCALER

DDC_5V 2Q25 100n IQ25 7Q25 M24C02-WMN6 Φ (256x8) EEPROM ADR WC SCL SDA FQ25 3Q25 10K 3Q26 10K 3Q27 10K

B12 FROM CINCH ANALOG

PC AUDIO IN AV3_L AV3_R FQ30 FQ31 S080 S081 3Q30 10K 3Q31 10K 2Q30 180p 2Q31 180p 3Q32 15K 3Q33 15K 2Q32 2u2 2Q33 2u2 IQ30 IQ31 AV3_LEFT AV3_RIGHT

B12 TO HDMI

HDMI - (NAFTA & AP ONLY)

1Q03 DC1R019JDA HDMI CONNECTOR

FQ40 FQ41 FQ42 FQ43 FQ44 FQ45 FQ46 FQ47 FQ48 NC (CEC) FQ49 FQ50 FQ51 FQ52

RX2+ RX2- RX1+ RX1- RX0+ RX0- RXC+ RXC- DOC_SCL DOC_SDA +5VHDMI

3Q40 1K0 7Q01 BC847BW 3Q34 2K2 HDMI_HOTPLUG_RESET

1Q01 A1
1Q03 E6
2Q01 A4
2Q06 B4
2Q11 B4
2Q16 A2
2Q17 B1
2Q18 B2
2Q21 C5
2Q23 D5
2Q25 D2
2Q30 E3
2Q31 E3
2Q32 E3
2Q33 E3
3Q01 A5
3Q06 B5
3Q11 B5
3Q16 A2
3Q17 B2
3Q18 B3
3Q21 C4
3Q22 C5
3Q23 D4
3Q24 D5
3Q25 D2
3Q26 D3
3Q27 D3
3Q30 E2
3Q31 E2
3Q32 E3
3Q33 E3
3Q34 F7
3Q40 F7
5Q01 A5
5Q06 B5
5Q11 B5
5Q16 A3
5Q21 C4
5Q23 D4
6Q16 A3
7Q01 F7
7Q25 D1
FQ01 A2
FQ02 A2
FQ03 A2
FQ04 A2
FQ05 A1
FQ06 B2
FQ07 B2
FQ08 B2
FQ09 B2
FQ10 B2
FQ25 D2
FQ30 E1
FQ31 E1
FQ40 E6
FQ41 E6
FQ42 E6
FQ43 E6
FQ44 E6
FQ45 E6
FQ46 E6
FQ47 F6
FQ48 F6
FQ49 F6
FQ50 F6
FQ51 F6
FQ52 F6
IQ01 A2
IQ02 A3
IQ03 A2
IQ21 D8
IQ23 C8
IQ25 D1
IQ30 E4
IQ31 E4
S080 E2
S081 E2

3139 123 6058.1

F_15270_032.eps
170505

SSB: Cinch Analog I/O (1FH)

B23 CINCH ANALOGUE IO (1FH)

B23

AV1:CVBS+YPbPr+Audio L/R

AV2: SVHS+CVBS+Audio L/R

RESERVED FOR DMMI

RESERVED FOR SET WITH DMMI ONLY

RESERVED FOR DMMI

DMMI CONNECTOR (V1.1) K5

TO/FROM 1500 OF (AP ONLY)

TO HERCULES B2

TO MUX-SYNC INTF B13

FROM SIDE CONNECTOR B17

FROM SCALER B7

TO CINCH DIGITAL B22

3139 123 6058.1

F_15270_033.eps 170505

Layout Small Signal Board (Top Side Overview)

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3G73 D5 4G15 D5 6F00 D1
3G74 D5 4G16 D5 6F01 D1
3G75 D5 4G17 D5 6G02 D3
3G76 D5 4G18 D4 6G03 D5
3G77 D5 4G20 D3 6G04 D5
3G78 D5 4G21 D3 6G05 D5
3G79 D5 4G22 D3 6G06 D5
3G80 D5 4J01 A4 7206 B5
3G81 D5 4J02 A5 7214 B6
3G82 D5 4M04 C4 7215 B5
3G83 D5 4M16 C4 7216 B6
3G84 D5 4M17 C4 7218 B5
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3G86 D5 4N02 A1 7501 A6
3G87 D5 4N03 B2 7502 A6
3G88 D5 4N04 A1 7503 A6
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3G90 D4 4N06 A1 7505 A6
3G91 D4 4N07 A2 7506 A6
3G92 D3 4N08 A1 7752 A3
3G93 D3 4N09 A2 7801 B2
3G94 D3 4N10 A1 7901 C4
3G95 D3 4N11 A2 7A00 B3
3G96 D2 4N12 A1 7A02 B3
3G99 D2 4N13 A2 7A03 B3
3J03 A5 4N14 A1 7B01 B1
3J04 A5 4N15 A2 7C00 B3
3J05 A5 4N16 A1 7D01 C1
3J06 A5 4N17 A2 7D02 C1
3L07 B5 4N18 A1 7D03 C1
3L09 B5 4N19 A2 7E00 C4
3M12 C4 4N20 A1 7E01 C3
3M13 C4 4P01 A1 7E02 C4
3M16 C4 4P02 A1 7F03 D1
3M26 C4 4P03 A1 7G07 D3
3M28 C5 4P04 A1 7G08 D3
3M68 C5 4P05 A1 7G09 D5
3M69 C5 4P06 A1 7G10 D3
3M71 C5 4P07 A1 7L05 C5
3M88 C4 4P08 A1 7M03 B4
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3M90 C4 5202 B5 7M15 C5
3N21 B2 5203 A6 7N02 A2
3N22 B2 5204 A6 7N04 B2
3N23 B2 5205 B5 7P02 A1
3N24 B2 5206 A6
3N25 B2 5207 A6
3N36 A2 5208 A6
3N37 A2 5209 A5
3N38 A2 5210 A6
3N39 A2 5212 A5
3N40 A2 5213 A5
3N41 A2 5215 B5
3P04 A1 5217 B6
3P05 A1 5218 B5
3S00 D2 5431 A5
3S03 D2 5501 A6
4107 B6 5712 A4
4108 B6 5737 A4
4201 B5 5752 A3
4202 B5 5753 A3
4203 B5 5754 A3
4205 C5 5900 B3
4206 C5 5A00 B2
4213 B5 5D00 C1
4214 B5 5D01 C1
4215 B5 5D02 C1
4507 A6 5D03 D2
4508 A6 5D04 D1
4509 A6 5E00 D4
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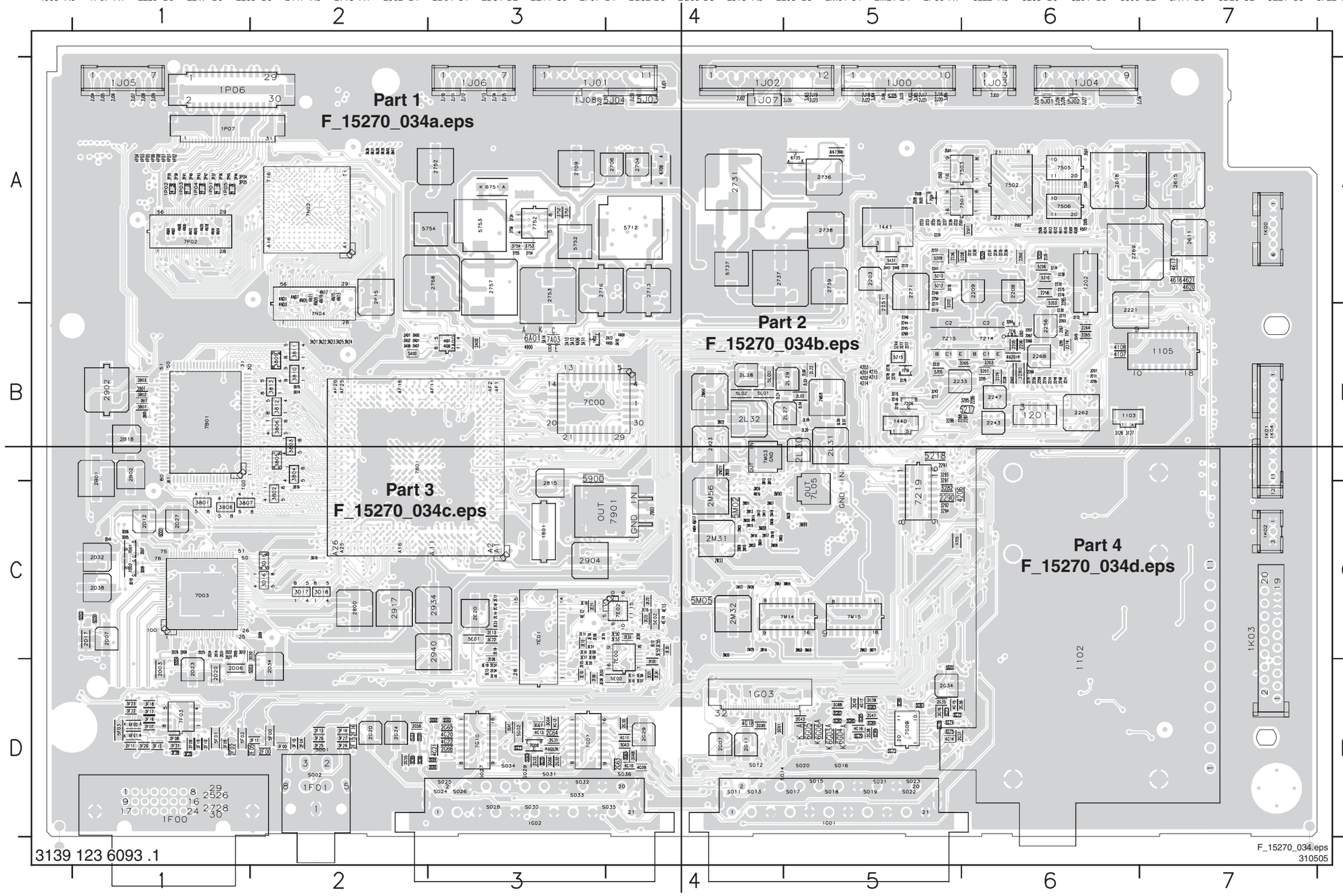
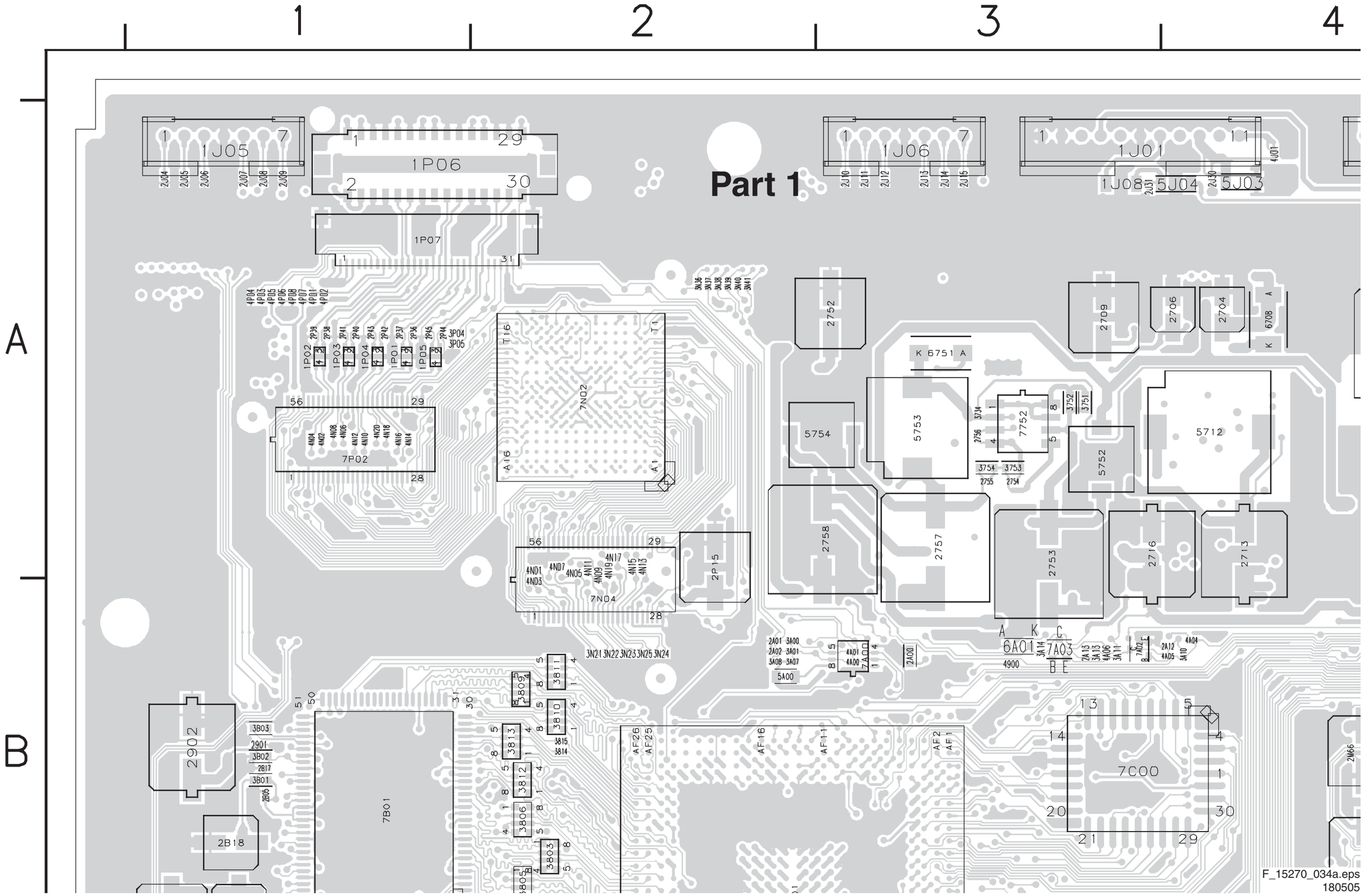


Layout Small Signal Board (Top Side Part 1)



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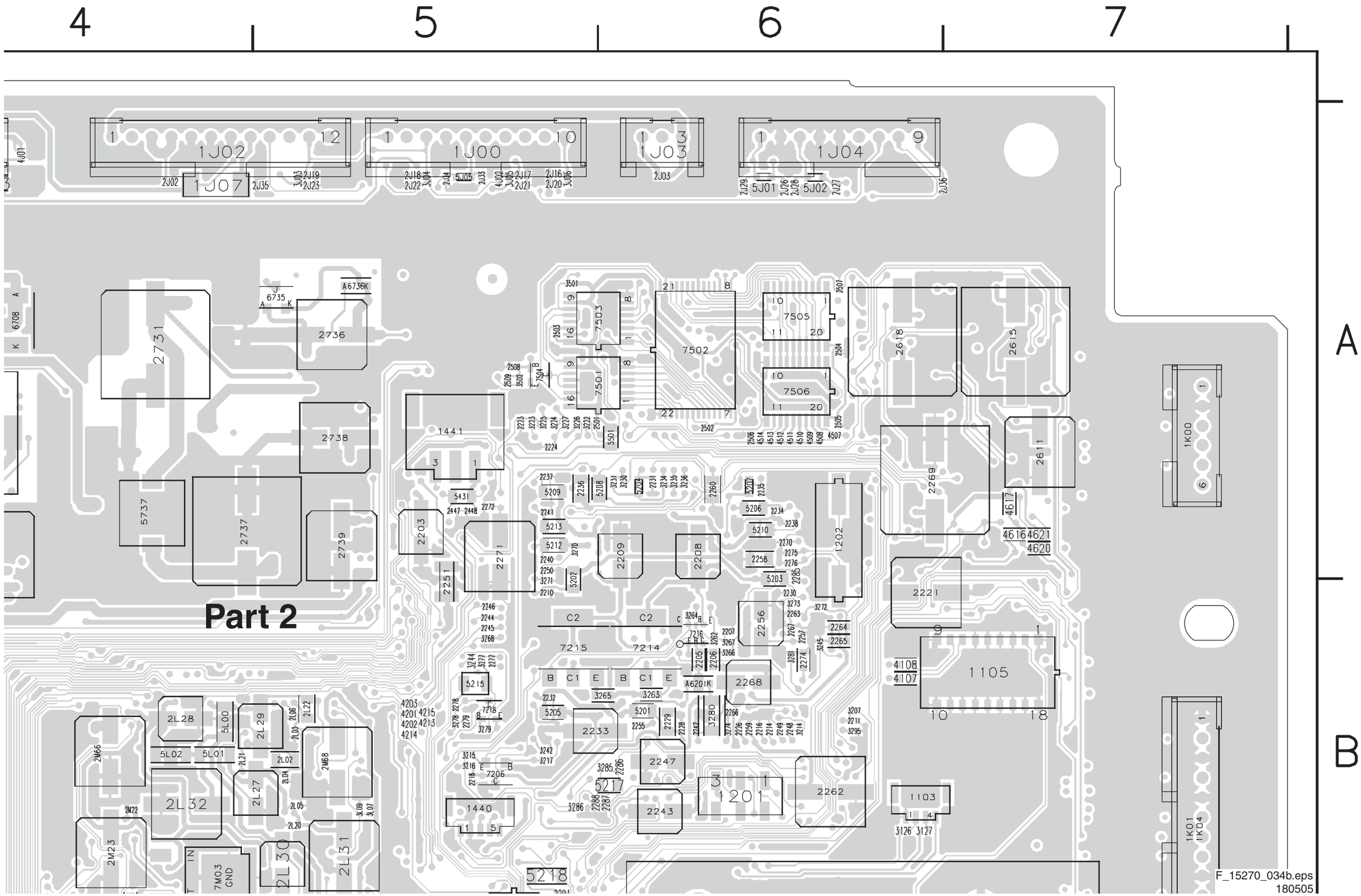

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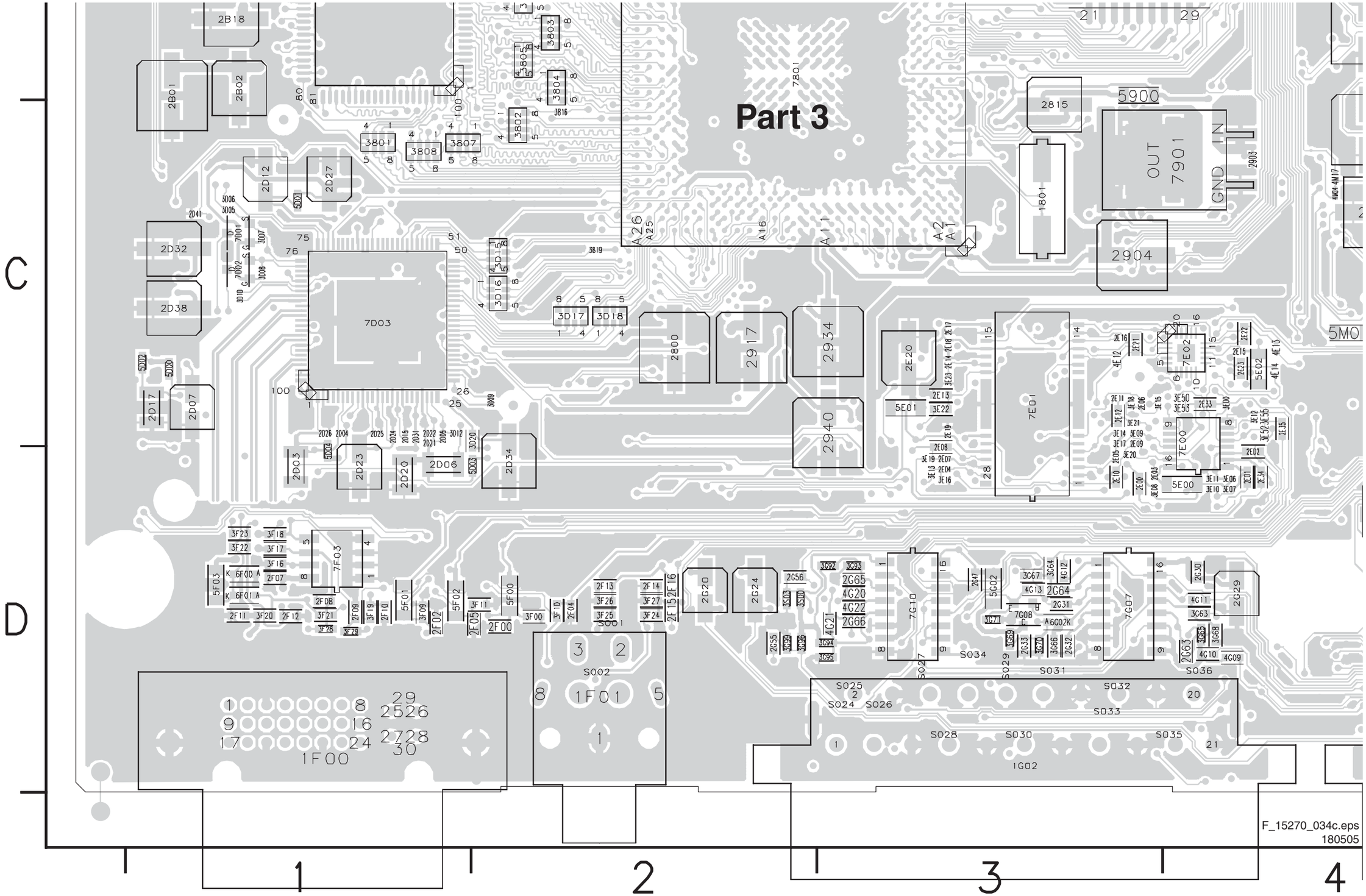
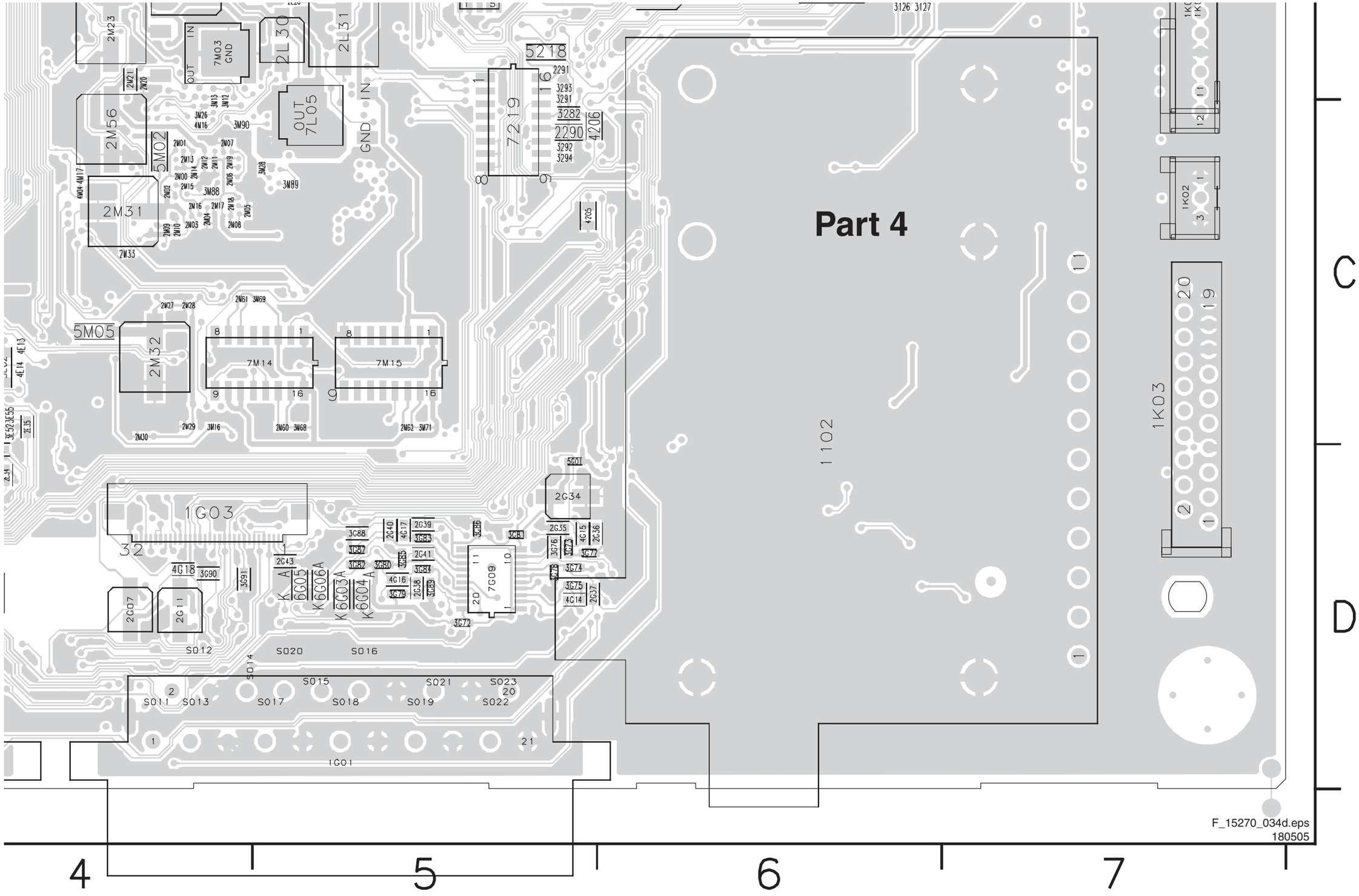


Layout Small Signal Board (Top Side Part 4)



Layout Small Signal Board (Bottom Side Overview)

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3L26 B4 4209 A3 5905 B6 7D00 C7
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3L33 B3 4439 B3 5911 C6 7G03 D3
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3M01 C4 4506 A2 5L04 B3 7L08 B3
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3N09 A6 4K07 B1 6E03 C5
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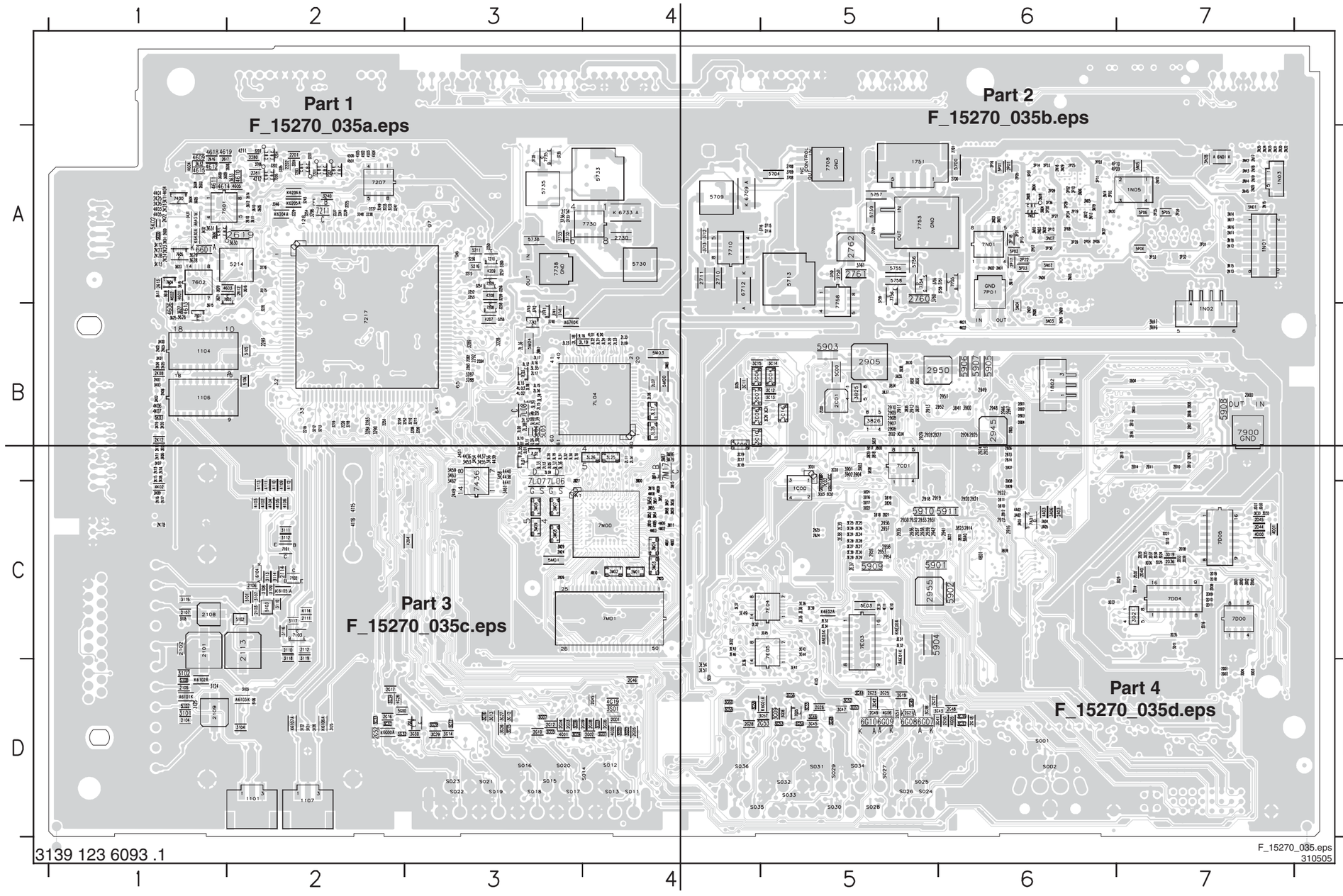
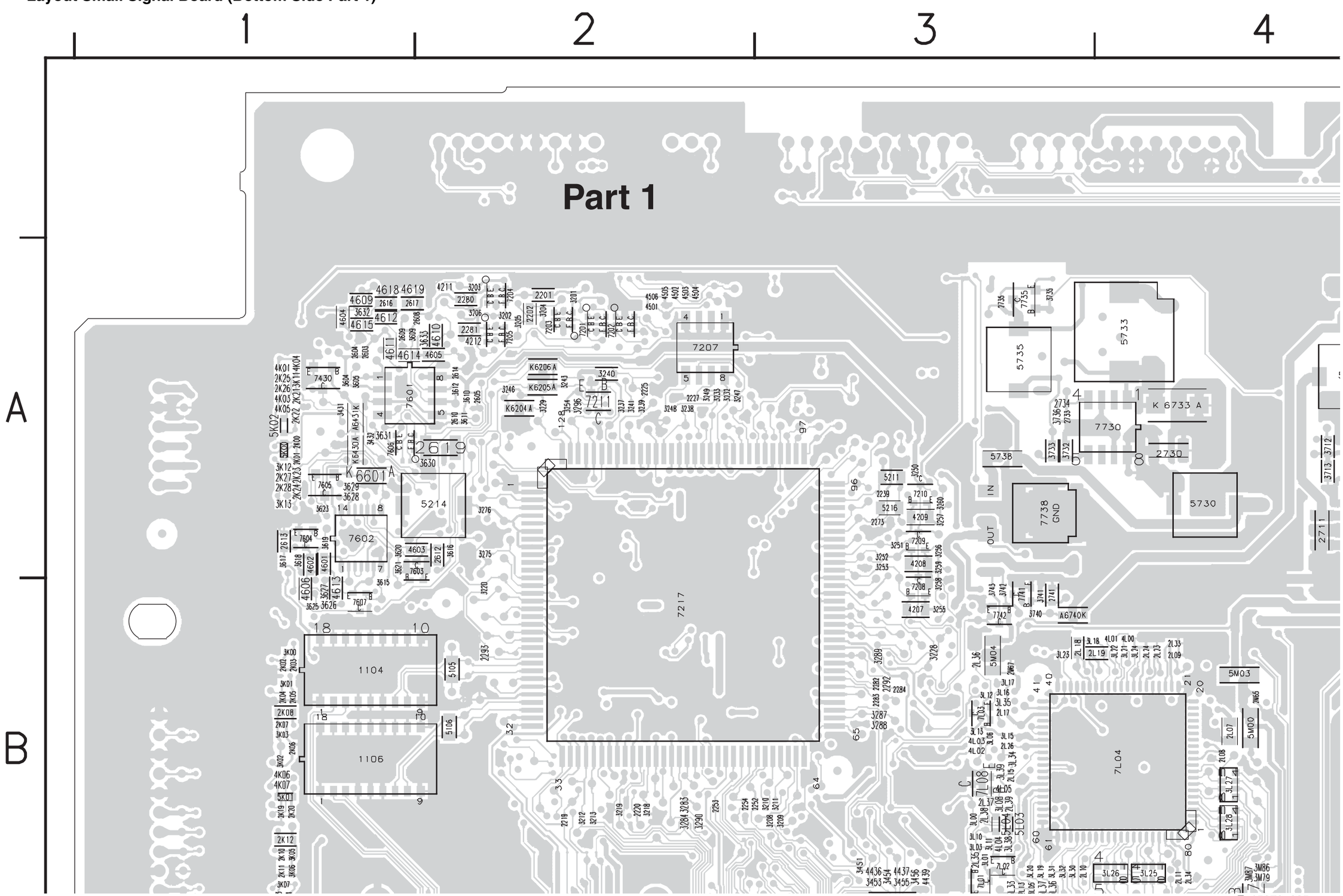


Layout Small Signal Board (Bottom Side Part 1)



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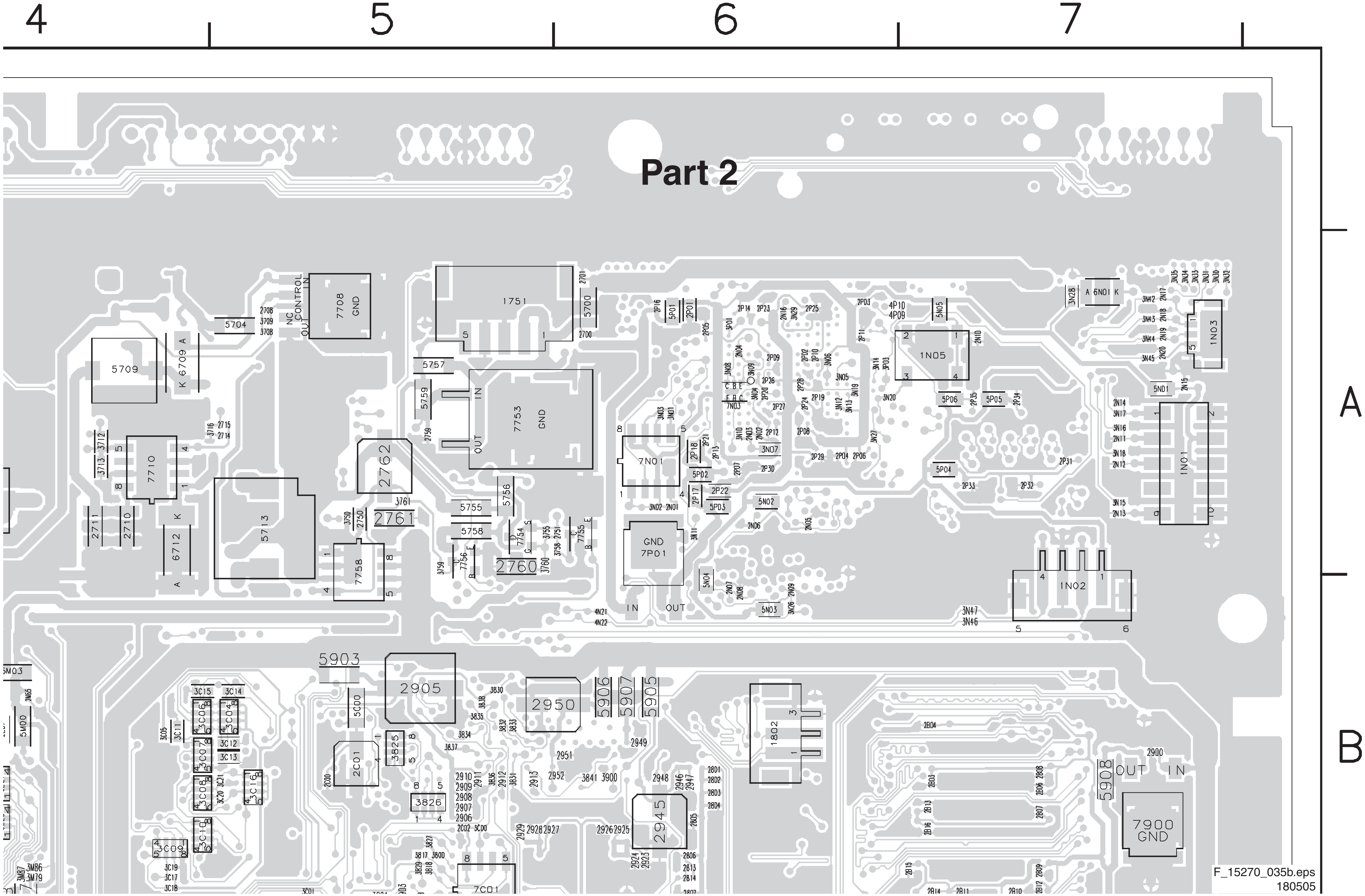
Layout Small Signal Board (Bottom Side Part 2)



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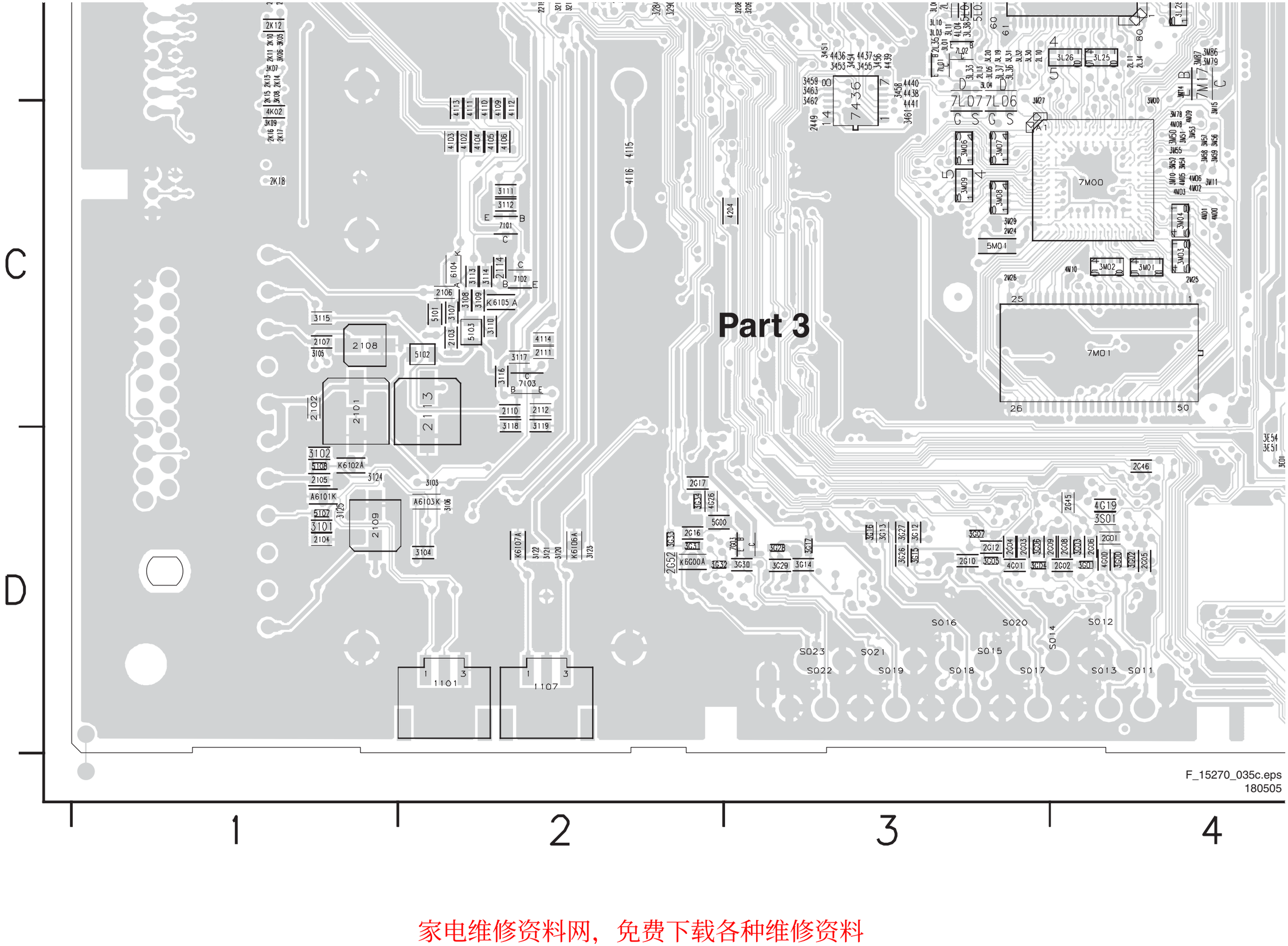
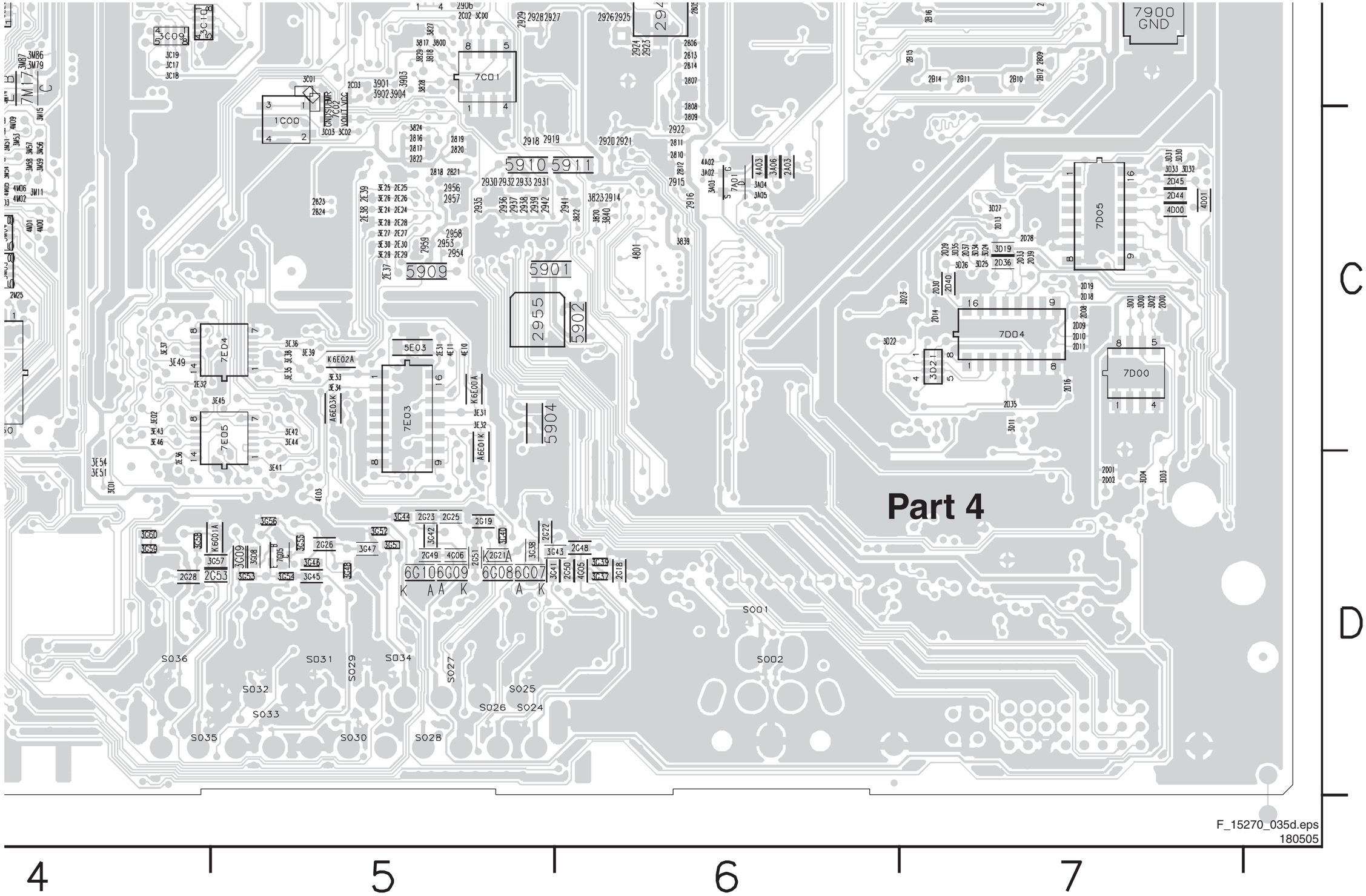


Layout Small Signal Board (Bottom Side Part 4)



PDP Audio Amplifier Panel

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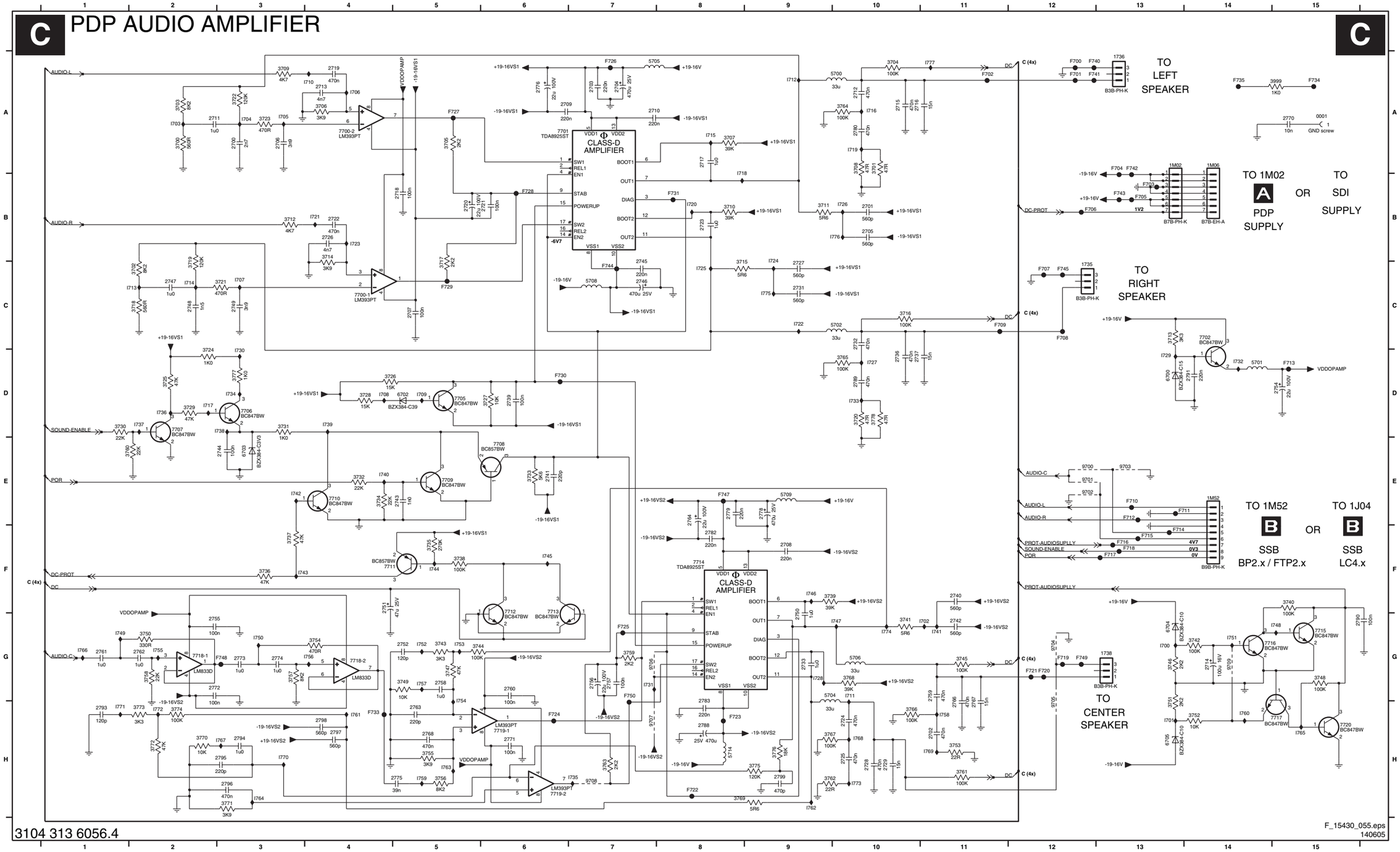
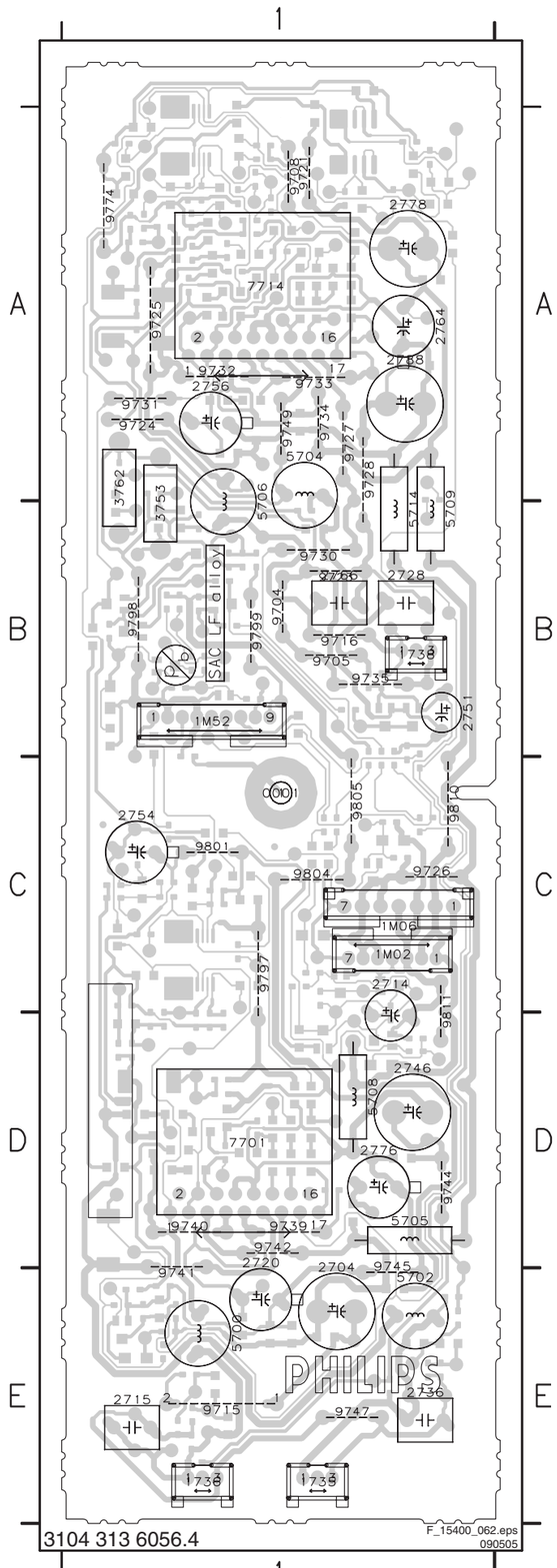


Layout PDP Audio Amplifier Panel (Top Side)



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1M52 B1
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2714 C1
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2720 D1
2728 B1
2736 E1
2746 D1
2751 B1
2754 C1
2756 A1
2764 A1
2766 B1
2776 D1
2778 A1
2788 A1
3753 B1
3762 A1
5700 E1
5702 E1
5704 A1
5705 D1
5706 A1
5708 D1
5709 B1
5714 A1
7701 D1
7714 A1
9704 B1
9705 B1
9708 A1
9715 E1
9716 B1
9721 A1
9723 B1
9724 A1
9725 A1
9726 C1
9727 A1
9728 B1
9730 B1
9731 A1
9732 A1
9733 A1
9734 A1
9735 B1
9739 D1
9740 D1
9741 E1
9742 D1
9744 D1
9745 D1
9747 E1
9749 A1
9774 A1
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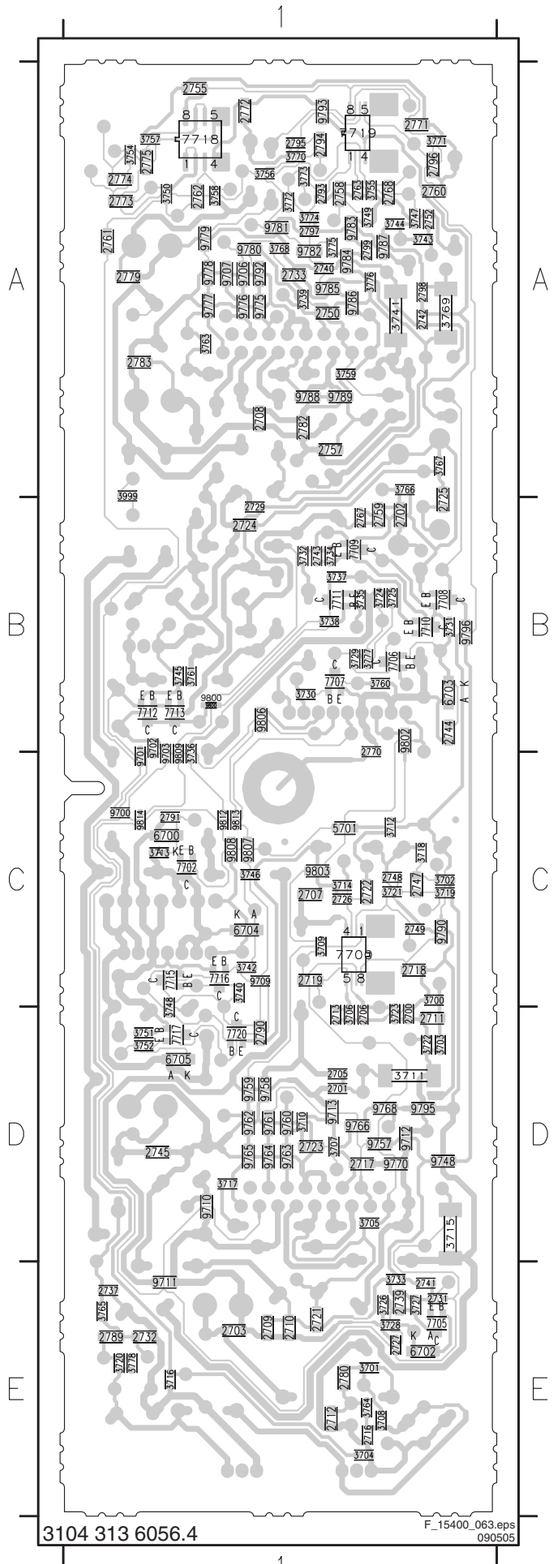
9799 B1
9801 C1
9804 C1
9805 C1
9810 C1
9811 C1

Layout PDP Audio Amplifier Panel (Bottom Side)



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2702 B1
2703 E1
2705 D1
2706 D1
2707 C1
2708 A1
2709 E1
2710 E1
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2712 E1
2713 D1
2716 E1
2717 D1
2718 C1
2719 C1
2721 E1
2722 C1
2723 D1
2724 B1
2725 B1
2726 C1
2727 E1
2729 B1
2731 E1
2732 E1
2733 A1
2737 E1
2739 E1
2740 A1
2741 E1
2742 A1
2743 B1
2744 B1
2745 D1
2747 C1
2748 C1
2749 C1
2750 A1
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2755 A1
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2758 A1
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7712 B1
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7717 D1
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9758 D1
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9760 D1
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9763 D1
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9765 D1
9766 D1
9768 D1
9770 D1
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9779 A1
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9785 A1
9786 A1
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9788 A1
9789 A1
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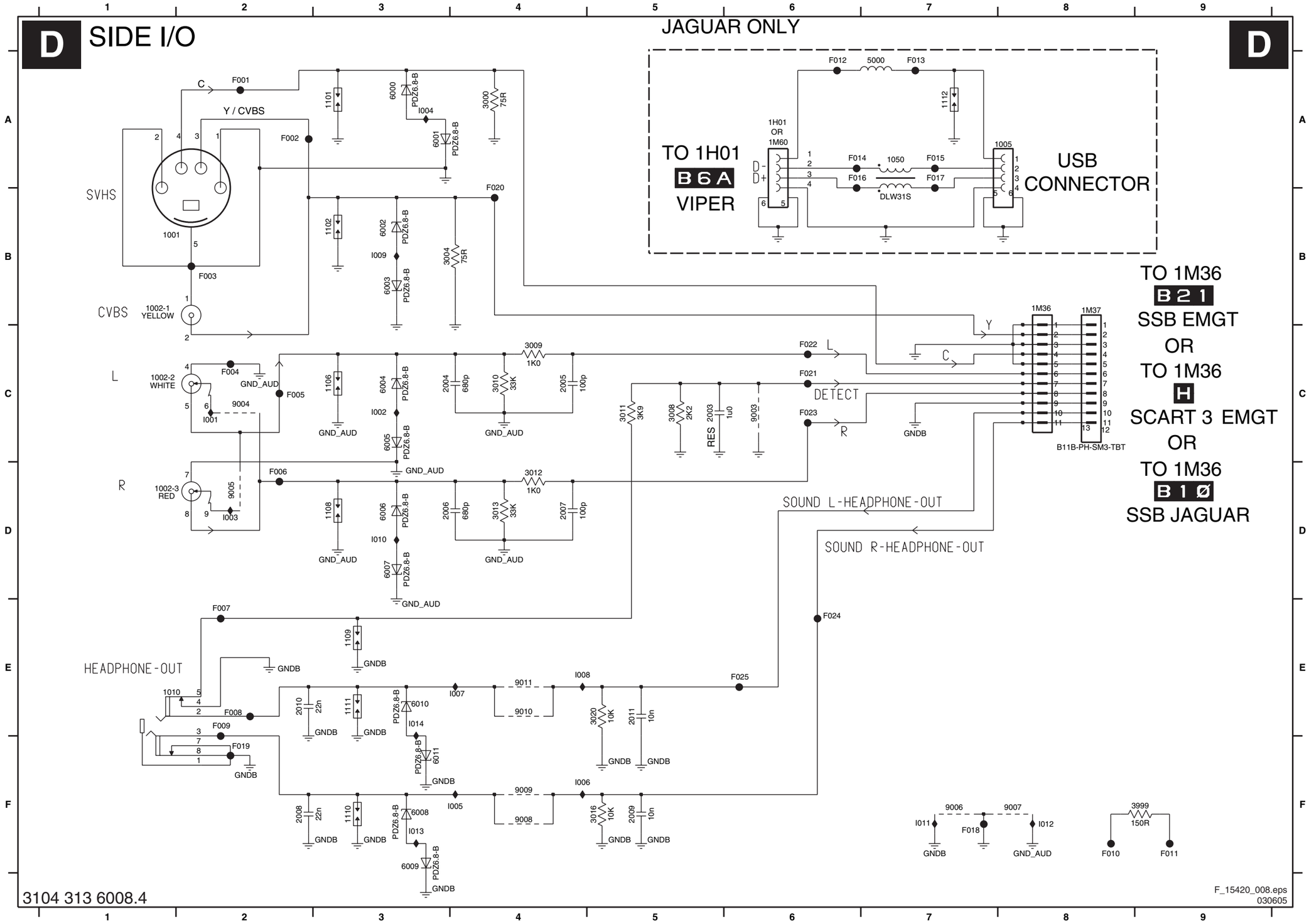
9807 C1

Side I/O Panel



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1002-3 D1	F005 C2
1005 A8	F006 D2
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1050 A7	F008 E2
1101 A3	F009 E2
1102 B3	F010 F8
1106 C3	F011 F9
1108 D3	F012 A6
1109 E3	F013 A7
1110 F3	F014 A6
1111 E3	F015 A7
1112 A7	F016 A6
1H01 A6	F017 A7
1M36 B8	F018 F7
1M37 B8	F019 F2
2003 C5	F020 B4
2004 C3	F021 C6
2005 C4	F022 C6
2006 D3	F023 C6
2007 D4	F024 E6
2008 F2	F025 E6
2009 F5	I001 C2
2010 E2	I002 C3
2011 E5	I003 D2
3000 A4	I004 A3
3004 B3	I005 F4
3008 C5	I006 F4
3009 C4	I007 E4
3010 C4	I008 E4
3011 C5	I009 B3
3012 D4	I010 D3
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3999 F9	I014 E3
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6000 A3	
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6003 B3	
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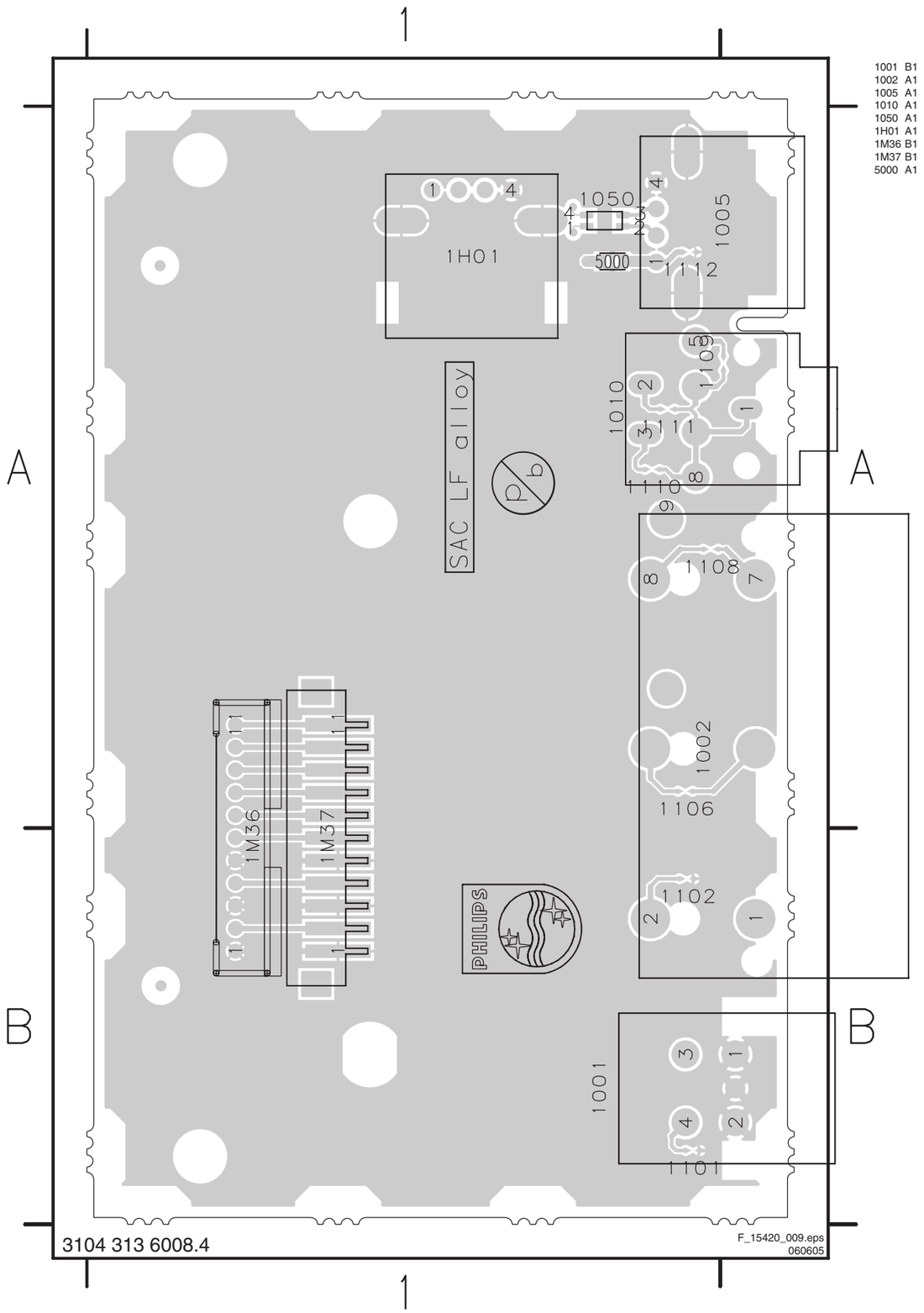
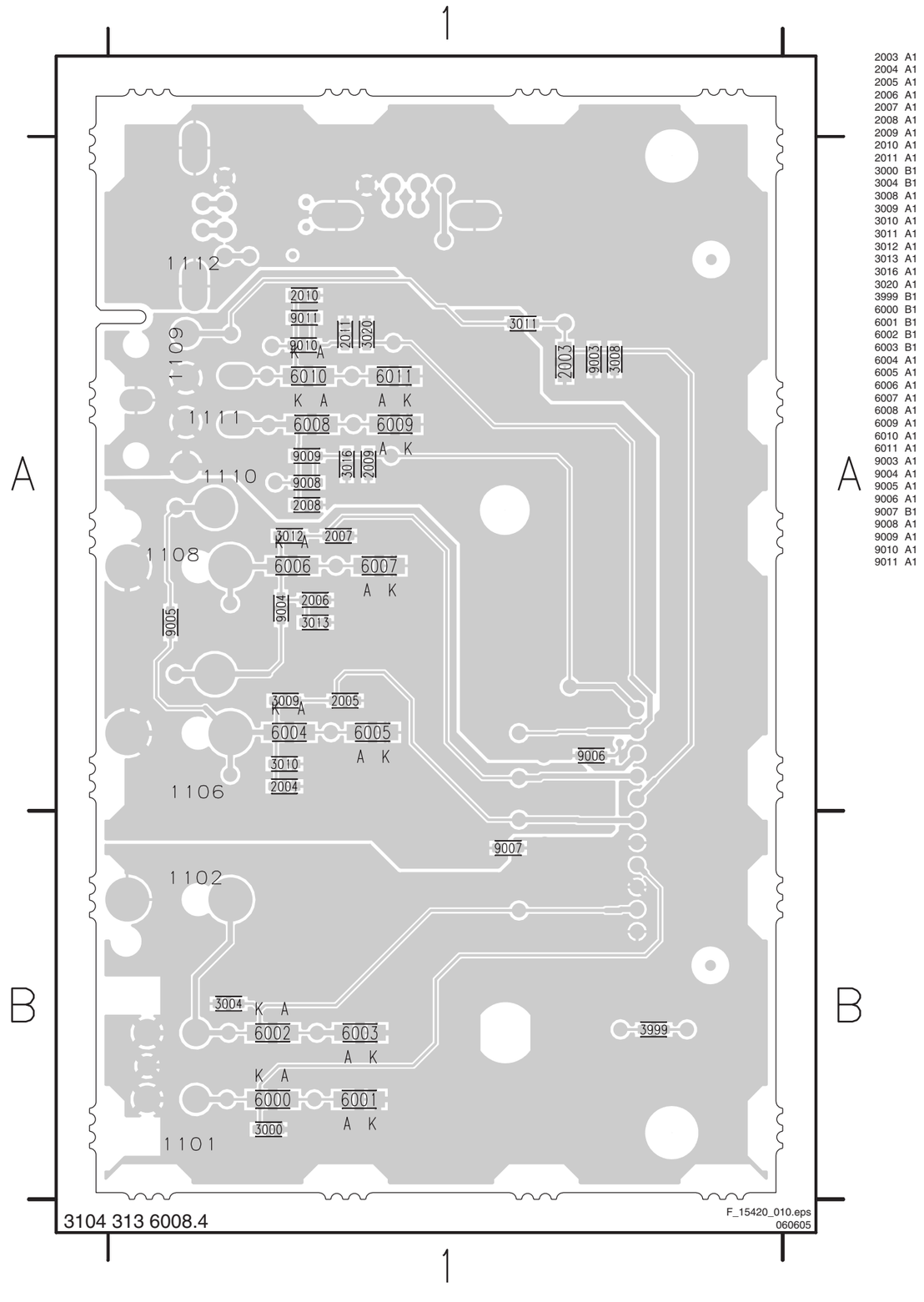
Layout Side I/O Panel (Top Side)



Layout Side I/O Panel (Bottom Side)



Control Board

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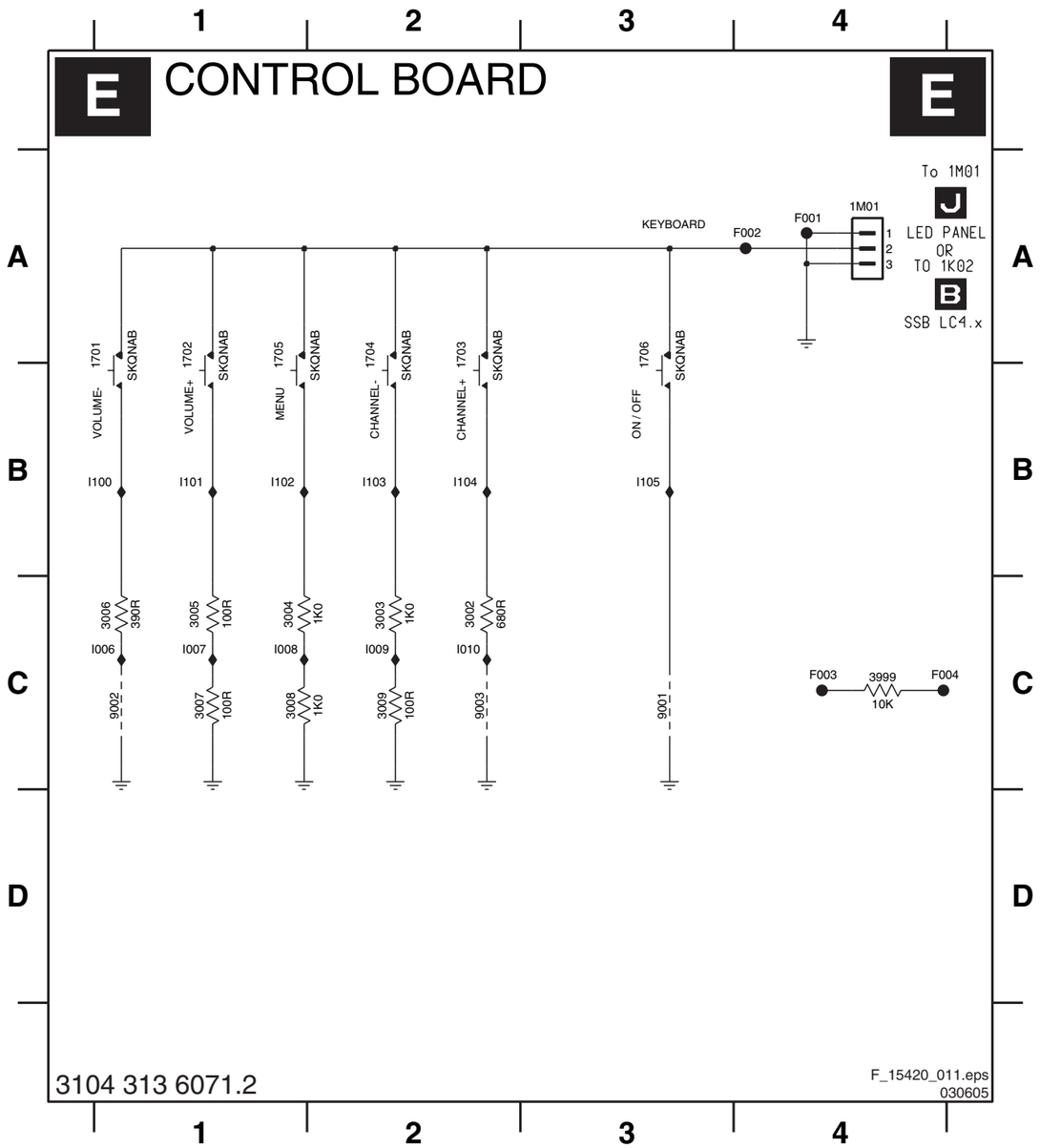
1702 A1	1705 A1	3002 C2	3005 C1	3008 C1	9001 C3	F001 A4	F004 C4	I008 C1	I100 B1	I103 B2	
1703 A2	1706 A3	3003 C2	3006 C1	3009 C2	9002 C1	F002 A4	I006 C1	I009 C2	I101 B1	I104 B2	



Personal Notes:

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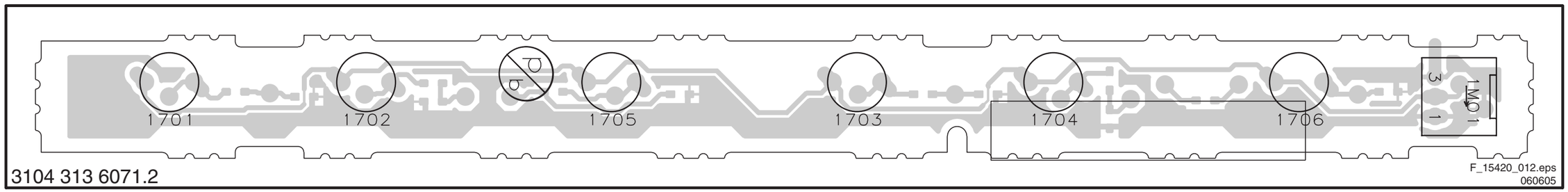
131004

Layout Control Board (Top Side)

1701 -- 1702 -- 1703 -- 1704 -- 1705 -- 1706 -- 1M01 --



3104 313 6071.2

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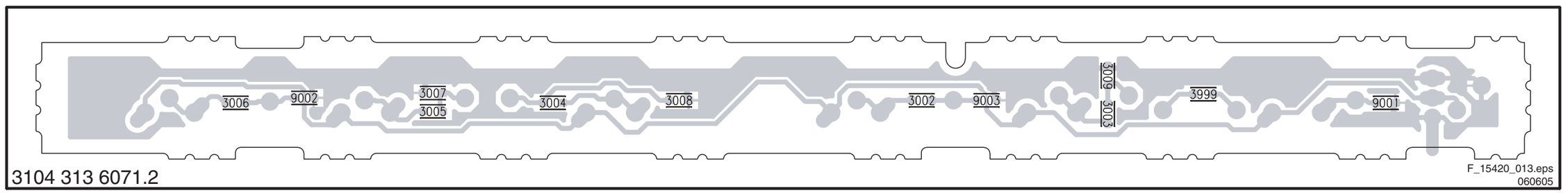
060605

Layout Control Board (Bottom Side)

3002 -- 3003 -- 3004 -- 3005 -- 3006 -- 3007 -- 3008 -- 3009 -- 3999 -- 9001 -- 9002 -- 9003 --



3104 313 6071.2

F_15420_013.eps
060605

LED Panel

LED PANEL

"BLUE" or "GREEN"

"RED"

"LED DIMMING"

"IR RECEIVER"

"LIGHT SENSOR"

TO 1M20 B SSB JL2.x / LC4.x OR TO 1M20 B E EXTERNALS FTx2.x / Bx2.x

TO 1M01 E CONTROL BOARD

TO 0345 E TOP CONTROL

KEYBOARD, COM-SND, LED1, RC, LIGHT-SENSOR, LED2, BLACKLIGHT-TC

BC857B, BC847BW, BC847BW, BC847BW, BC847BW, BC847BW, BC847BW, BC857BW, BCP53, TSOP34836YA1, LM358P, TEMD3000

3104 313 6074.3

F_15420_014.eps 030605

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0002 A11 9120 B10
0345 D2 9121 B11
1040 F9 9122 F11
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1M20 A2 F011 A3
2014 C4 F012 A3
2030 G5 F013 B3
2040 F9 F014 B3
2070 F12 F015 A3
2071 G12 F016 B3
3011 A4 F017 B3
3030 G4 F018 B2
3031 G5 F021 C3
3032 G5 F038 B12
3033 G5 F039 B12
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3036 G7 F086 E3
3037 G7 F089 E3
3040 F9 I010 F2
3041 G9 I011 G2
3042 F9 I012 E3
3051 B8 I013 E4
3052 B8 I026 F12
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3054 C8 I037 G7
3055 C8 I038 G6
3056 D6 I039 G4
3061 B6 I040 G5
3062 B6 I041 G9
3063 D5 I042 G9
3064 D5 I043 F9
3070 G11 I044 F9
3071 F12 I045 F9
3072 G13 I046 E9
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3076 G14 I051 D8
3077 G12 I052 C8
3078 G11 I053 B9
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3093 F3 I062 C6
3094 F2 I063 D7
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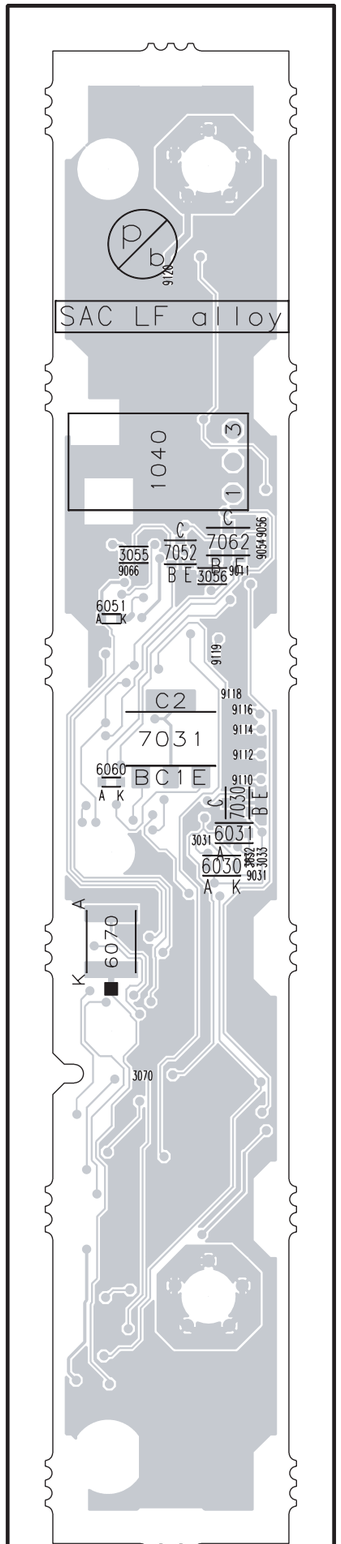
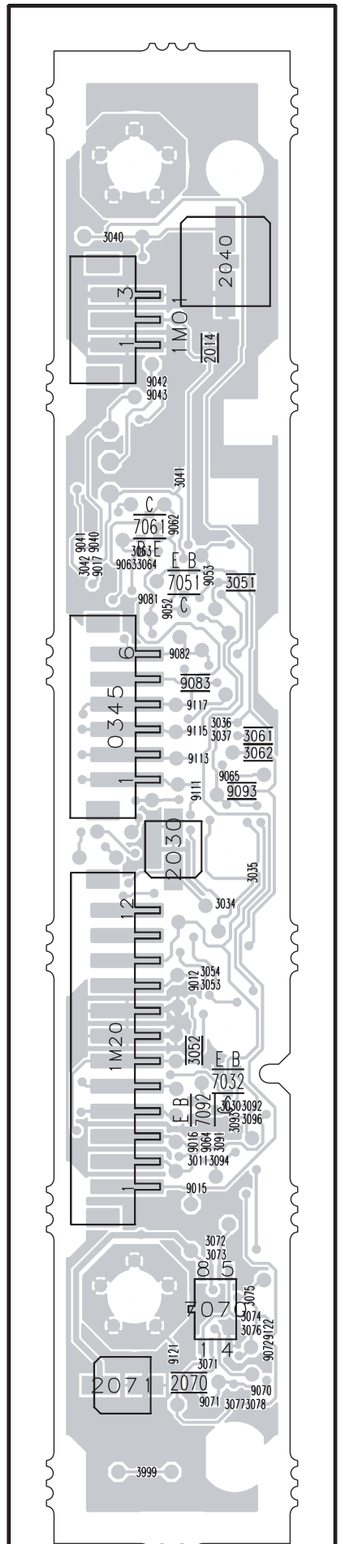
9118 E2

Layout LED Panel



3104 313 6074.3 F_15420_015.eps 060605

1040 --
3031 --
3032 --
3033 --
3055 --
3056 --
3070 --
6030 --
6031 --
6051 --
6060 --
6070 --
7030 --
7031 --
7052 --
7062 --
9011 --
9031 --
9054 --
9056 --
9066 --
9110 --
9112 --
9114 --
9116 --
9118 --
9119 --
9120 --



3104 313 6074.3 F_15420_016.eps 060605

0345 --
1M01 --
1M20 --
2014 --
2030 --
2040 --
2070 --
2071 --
3011 --
3030 --
3034 --
3035 --
3036 --
3037 --
3040 --
3041 --
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9113 --
9115 --
9117 --
9121 --
9122 --

Personal Notes:

E_06532_012.eps 131004

8. Alignments

Index of this chapter:

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the Cursor Up, Down, Left or Right keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:
Mains voltage and frequency: 100-240 V / 50/60 Hz.
Allow the set to warm up for approximately 10 minutes.
Test probe: Ri > 10 MΩ; Ci < 2.5 pF.

8.2 Hardware Alignments

There are no hardware alignments foreseen for the plasma-TV.

8.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the geometry, white tone and tuner (IF) can be aligned.
To store the data: Use the RC button Menu to switch to the main menu and next, switch to ‘Stand-by’ mode.

8.3.1 SAM Menu

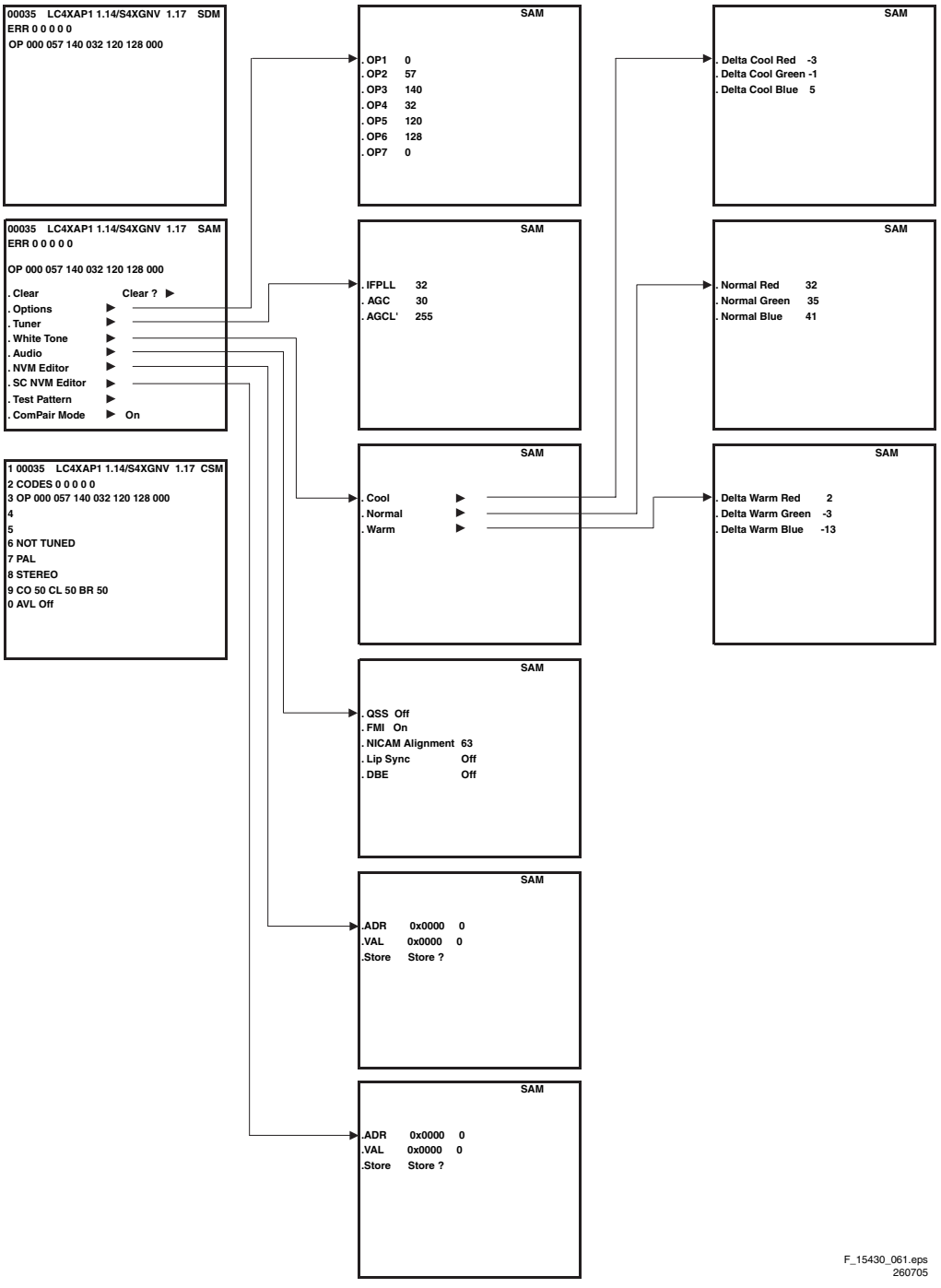


Figure 8-1 Overview SAM menu.

8.3.2 Tuner Adjustment

AGC (RF AGC Take Over Point)

- Activate the SAM menu.
- Go to the sub-menu Tuner.
- Select the AGC sub-menu.
- Adjust the AGC value to AGC = 27.
- Adjust the AGC L' value to AGC L' = 27 (Europe only).
- Adjust the IFPLL value to IFPLL = 32 (Europe only).
- Switch the set to standby to store the data.

8.3.3 DCXO (Digital Xtal Oscillator) Alignment (for NICAM sets only)

- Input a Colour bar signal with a colour subcarier frequency of 4.43 MHz on SCART1 or SCART2.
- Select as a signal source EXT1 or AV1.
- Go to the SAM menu and select Audio.
- Activate DCXO Alignment and wait until this process has finished (DONE).
- Check if the NICAM audio reception is OK, if not: repeat the procedure.
- Switch the set to standby to store the data.

8.3.4 ADC Gain and Grey Scale Alignment

The table below shows a number of NVM settings used for each model of TV set. Be sure to use the correct editor in the SAM menu (NVM Editor or SC NVM Editor), because the first one is used for the Hercules NVM, and the second one for the SCALER (SC) part of the TV set. For further important NVM settings, see also the other NVM tables elsewhere in this manual.

Caution:

- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orgininal settings, if the new settings turn out to be incorrect.

Table 8-1 ADC gain and grey scale alignment

SDTV ADC Gain settings: Use the NVM Editor in SAM to set these values in the Hercules NVM						
		These models are with ADC & Columbus 3D Combfilter				
Setting	Hercules NVM Address (decimal value)	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93	Settings Range (decimal value)
NVM_ADC_GAIN_R	006	143	143	143	143	075 - 155
NVM_ADC_GAIN_G	007	191	191	191	191	200 - 250
NVM_ADC_GAIN_B	008	143	143	143	143	075 - 155

SDTV Greyscale settings: Use the SC NVM Editor in SAM to set these values in the Scaler NVM						
		These models are with ADC & Columbus 3D Combfilter				
Setting	Scaler NVM Address (decimal value)	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93	Settings Range (decimal value)
ADC_RED_OFFSET2	338	080	080	080	080	050 - 110
ADC_GRN_OFFSET2	339	080	080	080	080	050 - 110
ADC_BLU_OFFSET2	340	080	080	080	080	050 - 110
ADC_RED_GAIN	341	154	154	154	154	045 - 095
ADC_GRN_GAIN	343	154	154	154	154	045 - 095
ADC_BLU_GAIN	345	154	154	154	154	045 - 095
PC Greyscale settings						
		These models are with ADC & Columbus 3D Combfilter				
Setting	Scaler NVM Address (decimal value)	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93	Settings Range (decimal value)
ADC_RED_OFFSET2	325	080	080	080	080	040 - 090
ADC_GRN_OFFSET2	326	080	080	080	080	040 - 090
ADC_BLU_OFFSET2	327	080	080	080	080	040 - 090
ADC_RED_GAIN	328	154	154	154	154	180 - 270
ADC_GRN_GAIN	330	154	154	154	154	180 - 270
ADC_BLU_GAIN	332	154	154	154	154	180 - 270
HD Greyscale settings						
		These models are with ADC & Columbus 3D Combfilter				
Setting	Scaler NVM Address (decimal value)	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93	Settings Range (decimal value)
ADC_RED_OFFSET2	351	064	064	064	064	050 - 090
ADC_GRN_OFFSET2	352	082	082	082	082	050 - 090
ADC_BLU_OFFSET2	353	064	064	064	064	050 - 090
ADC_RED_GAIN	354	159	159	159	159	120 - 200
ADC_GRN_GAIN	356	144	144	144	144	120 - 200
ADC_BLU_GAIN	358	147	147	147	147	120 - 200

8.3.5 Sound

- For NICAM sets: see paragraph 8.3.3.
- For other sets: No adjustments needed for sound.

8.3.6 Options

Options OP1...OP7 in the SAM menu can be used for quickly restoring 64 features or settings of the HERCULES part of the TV set to their orginal default factory values (8 groups of 8 features/settings each). When the decimal value of one option byte OP1...OP7 is changed (see the first table below) then a group of 8 bits, representing 8 HERCULES options or features, is changed as well (see the second table below for a detailed description of the features or settings that are changed).
The second table shows which option byte (OP1...OP7) represents which group of 8 option bits. Each bit (0...7) switches a particular HERCULES feature or setting ON or OFF, depending on its value (1 or 0).
It is also possible to change the features or settings mentioned in the second table directly at bit level, by means of the NVM Editor in the SAM menu. In the NVM Editor, first the correct NVM address (ADR) has to be entered, then the correct value (VAL, 1 or 0) for each bit (see second table), and finally the settings have to be stored (STORE). For quickly restoring the HERCULES part of the TV set to its original factory settings, however, it is more convenient to simply enter the default factory settings OP1...OP7 that are given in the first table below. How to do this, is described in the next paragraph.

How to Change an Option Byte
As has been explained above, an Option byte (OP) represents a number of different HERCULES options. Changing these bytes directly makes it possible to set all HERCULES options very fast. All options are controlled via seven option bytes. Select the option byte (OP1.. OP7) with the Menu Up/ Down keys, and enter the new (decimal) value. For the correct Factory Default settings, see the first table below. For more detailed information, see the second table.

Leaving the Option submenu saves the changes in the Option Byte settings. Some changes will only take effect after the set has been switched “off” and “on” with the AC power switch (cold start).

Table 8-2 Option codes OP1...OP7

Option table for quickly restoring the HERCULES to its Factory Default settings				
Model number	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93
OP1	128	128	01	01
OP2	37	37	37	37
OP3	79	79	77	77
OP4	225	225	224	224
OP5	252	252	252	252
OP6	27	27	27	27
OP7	28	28	20	20
Options (can be changed only via the SAM menu)	Total decimal value for each option per model number			

How to Change Options at Bit Level
If you wish to know which features or settings of the HERCULES are changed via OP1...OP7, or if you want to change each option or feature bit by bit, use the more detailed table below.
Note: the table below contains only part of the NVM settings that can be changed. A second range of settings and features can be found in Chapter 5 of this manual, in table **NVM Default values**. The settings mentioned there can only be changed via the NVM editor. For further settings, see also the table “ADC Gain and Grey scale alignment” elsewhere in this manual.

Table 8-3 Option codes in detail, at bit level

Option byte & bit table for restoring the TV set to its original Factory Default settings via the NVM Editor in the SAM menu					
		Model number	50PF7320 /79 /98	42PF7320 /79 /98	50PF7320/93	42PF7320/93
OP1	**Description of feature/option to be switched ON or OFF**					
bit 7 (msb)	OP_PHILIPS_TUNER		1	1	0	0
bit 6	OP_FM_RADIO		0	0	0	0
bit 5	OP_LNA		0	0	0	0
bit 4	OP_ATS // for EU		1	1	1	1
bit 3	OP_ACI		1	1	1	1
bit 2	OP_UK_PNP		0	0	0	0
bit 1	OP_VIRGIN_MODE		0	0	0	0
bit 0 (lsb)	OP_CHINA		0	0	1	1
	Total DEC Value		128	128	01	01
	Total HEX Value		80	80	01	01
OP2						
bit 7 (msb)	OP_SC		0	0	0	0
bit 6	OP_IBEX		0	0	0	0
bit 5	OP_CHANNEL_NAMING		1	1	1	1
bit 4	OP_LTI (Lum Transcient Improvmt)		0	0	0	0
bit 3	OP_TILT		0	0	0	0
bit 2	OP_FINE_TUNING		1	1	1	1
bit 1	OP_PIP_PHILIPS_TUNER		0	0	0	0
bit 0 (lsb)	OP_HUE		1	1	1	1
	Total DEC Value		37	37	37	37
	Total HEX Value		25	25	25	25
OP3						
bit 7 (msb)	OP_EW_FUNCTION		0	0	0	0
bit 6	OP_PIXEL_PLUS		1	1	0	0
bit 5	OP_PIP_SPLITTER // temp		0	0	0	0
bit 4	OP_SPLITTER // temp		0	0	0	0
bit 3	OP_VIRTUAL_DOLBY		1	1	1	1
bit 2	OP_WIDE_SCREEN		1	1	1	1
bit 1	OP_WSSB		1	1	0	0
bit 0 (lsb)	OP_OP_ME5 // OP_ME5 - 5/6 local buttons implementation		1	1	1	1
	Total DEC Value		79	79	77	77
	Total HEX Value		4F	4F	4D	4D
OP4						
bit 7 (msb)	OP_LIP_SYNC		1	1	1	1
bit 6	OP_HD		1	1	1	1
bit 5	OP_ULTRA_BASS		1	1	1	1
bit 4	OP_DELTA_VOLUME		0	0	0	0
bit 3	OP_TAIWAN_KOREA		0	0	0	0
bit 2	OP_VOLUME_LIMITER		0	0	0	0
bit 1	OP_STEREO_DBX		0	0	0	0
bit 0 (lsb)	OP_STEREO_NICAM_2CS		1	1	0	0
	Total DEC Value		225	225	224	224
	Total HEX Value		E1	E1	E0	E0
OP5						
bit 7 (msb)	OP_AV1		1	1	1	1
bit 6	OP_AV2		1	1	1	1
bit 5	OP_AV3		1	1	1	1
bit 4	OP_CVI		1	1	1	1
bit 3	OP_SVHS2		1	1	1	1
bit 2	OP_SVHS3		1	1	1	1
bit 1	OP_HOTEL_MODE		0	0	0	0
bit 0 (lsb)	OP_SIMPLY_FACTORY=OP_BTSC_AVSTEREO		0	0	0	0
	Total DEC Value		252	252	252	252
	Total HEX Value		FC	FC	FC	FC
OP6						
bit 7 (msb)	OP_PERSONAL_ZAPPING		0	0	0	0
bit 6	OP_SMART_SURF		0	0	0	0
bit 5	OP_FMTRAP		0	0	0	0
bit 4	OP_COMBFILTER		1	1	1	1
bit 3	OP_ACTIVE_CONTROL		1	1	1	1
bit 2	OP_VIDEO_TEXT		0	0	0	0
bit 1	OP_LIGHT_SENSOR		1	1	1	1
bit 0 (lsb)	OP_TWIN_TEXT		1	1	1	1
	Total DEC Value		27	27	27	27
	Total HEX Value		1B	1B	1B	1B
OP7						
bit 7 (msb)	OP_TIME_WIN1		0	0	0	0
bit 6	OP_DVB_USB = OP_MALAY		0	0	0	0
bit 5	OP_AMBILIGHT		0	0	0	0
bit 4	OP_COLUMBUS		1	1	1	1
bit 3	OP_COLOR_SYSTEM_AP		1	1	0	0
bit 2	OP_SOUND_SYSTEM_AP_1		0	0	0	0
bit 1	OP_SOUND_SYSTEM_AP_2		1	1	1	1
bit 0 (lsb)	OP_SOUND_SYSTEM_AP_3		1	1	1	1
	Total DEC Value		28	28	20	20
	Total HEX Value		1C	1C	14	14

9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

Index of this chapter:

9.1 Introduction

The “LC4.9 Plasma TV” is a global plasma TV for the year 2005. It is the successor of the “LC4.7” and has a screen size of 42 inch or 50 inch (in 16:9 ratio). It has a new styling, called Entry+ 05. Globally, there are three different picture qualities available, depending on the model: Pixel Plus (used in the models discussed in this manual), Digital Crystal Clear, and Crystal Clear. The block diagram below (Figure “Block diagram”) shows the Pixel Plus architecture; the architectures of the other models are shown in the block diagram on the next page (Figure “Block diagram of the internal building blocks”).

The architecture consists of a TV and Scaler panel, an EPLD (only in the Pixel Plus model), an I/O panel, a Side I/O and Local Keyboard panel and a Power Supply panel.
The functions for video/audio processing, microprocessor (µP), and CC/Teletext (TXT) decoder are all combined in one IC (TDA150xx, item 7217), the so-called third generation Ultimate One Chip (UOC-III) or “Hercules”. This chip has the following features:

- Control, small signal, mono/stereo, and extensive Audio/ Video switching in one IC.
- Upgrade with digital sound & video processing.
- Alignment free IF, including SECAM-L/L1 and AM.
- FM sound 4.5/5.5/6.0/6.5, no traps/bandpass filters.
- Full multi-standard colour decoder.
- One Xtal reference for all functions (microprocessor, RCP, TXT/CC, RDS, colour decoder, and stereo sound processor).

9.2 Block Diagram

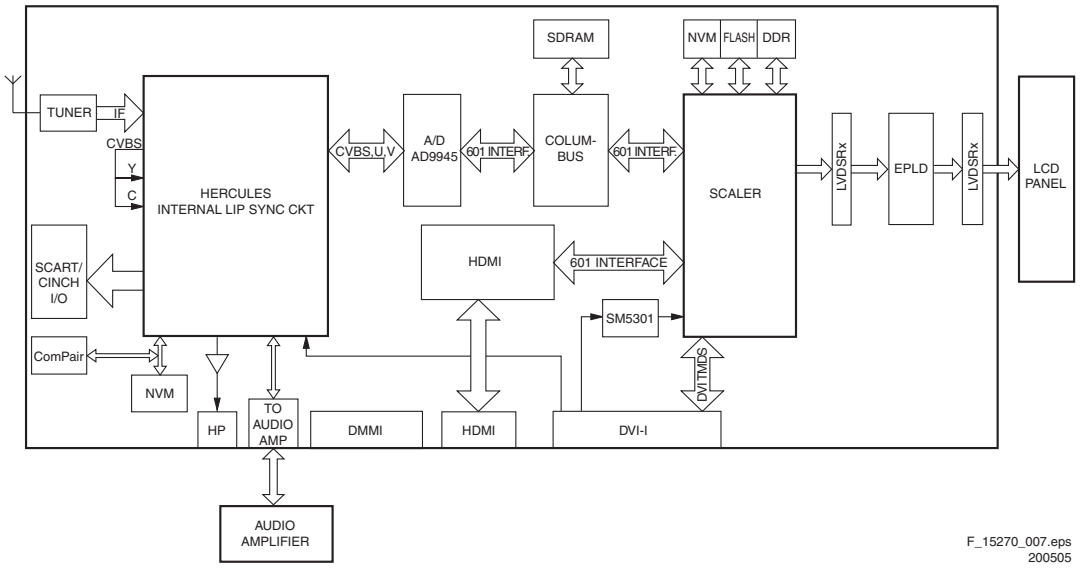


Figure 9-1 Block Diagram

The PLL tuner UV1316E/1318SD/TEDE9 delivers the IF-signal, via audio & video SAW-filters, to the Video Signal Processor and FLASH embedded TEXT/Control/Graphics Micro Controller TDA120x1 (item 7011, also called Hercules). This IC has the following functions:

- Analogue Video Processing
- Sound Demodulation
- Audio Interfaces and switching
- Volume and tone control for loudspeakers
- Reflection and delay for loudspeaker channels
- Micro Controller
- Data Capture
- Display

The Hercules has one input for the internal CVBS signal and a video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed. There are two rear analogue video inputs: AV is for SVHS in and video (CVBS) in, and CVI-1 is meant for RGB/YUV in). The rear VIDEO OUT cinch connector can be used for monitoring purposes: WYSIWYR (What you see is what you record).
Depending on the model of the TV set, the Hercules delivers its RGB signals either directly to the Scaler IC or indirectly, via a Columbus chip (for 2D/3D comb filtering and spatial/temporal noise reduction, for its description: see further down in this text). The EPLD, which is present in the Pixel Plus models discussed in this manual, provides additional sharpening to the picture. For a general outline, see the table and the block diagrams below, in which the architectures of the various models are given, together with their electronic building blocks.

Table 9-1 Models and picture quality

Model	Picture quality
50PF7320/79 /93 /98	Pixel Plus
42PF7320/79 /93 /98	Pixel Plus
N.a.	Digital Crystal Clear
N.a.	Crystal Clear

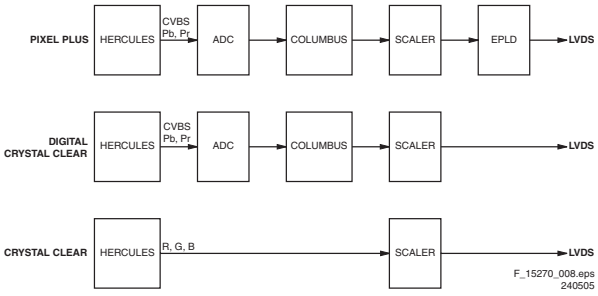


Figure 9-2 Block diagram of the internal building blocks

The Genesis GM1501 Malibu Scaler IC can receive two video input signals: SDTV (directly from Hercules or via Columbus), DVI (from an external DVI source), or PC (from external computer).
After the video processing, the digital data is sent via a Low Voltage Differential Signalling bus to the LCD panel. LVDS is used to improve data speed and to reduce EMI significantly.
There are two I²C lines and two interrupt and communication lines (TV_IRQ and TV_SC_COM) for the Scaler control. The Scaler communicates with the Hercules as a slave device. To avoid buffer overflow at the Scaler side, the TV_SC_COM line provides the necessary hardware flow control. To allow bi-directional communication, the Scaler can initiate a service interrupt-request to the Hercules via the TV_IRQ line.

The Hercules, and EEPROM are supplied with 3.3 V, which is also present during STANDBY.
The EEPROM, or NVM (Non Volatile Memory) is used to store the settings.

The sound part is built up around the Hercules. The Source Selection, Decoding and Processing are all done by the Hercules.

Power supply input are several DC voltages coming from a supply panel.

9.3 Input/Output

The I/O is divided over two parts: Rear I/O and Side I/O. The rear has two AV inputs with CVBS, Y/C and YUV, a PC (VGA) input, and an HDMI input. The side has a CVBS and Y/C (SVHS) input.
The selection of the external I/O's is controlled by the Hercules.

AV1 / CVI-1: The input of AV1 / CVI-1 is CVBS + YUV + L/R.
AV2: The input of AV2 is Y/C + CVBS + L/R.

PC-VGA/CVI-2: This input is directly going to the Scaler IC. See paragraph “Video: Scaler Part”.

HDMI in / PC-D: This input is directly going to the Scaler IC. See paragraph “Video: Scaler Part”.

9.4 Tuner and IF

A Philips UV1316E/1318SD/TEDE9 Tuner is used in the TV board. The SIF signals are decoded by the Hercules. Tuning is done via I²C.

9.4.1 Video IF Amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1104, in some models: 1105) and one for IF-audio (1106). The type of these filters depends on the standard(s) that has/have to be received.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 31 of the Hercules to pin 1 of the tuner. The AGC-detector operates on top sync and top white level. AGC take-over point is adjusted via the service alignment mode ’Tuner' - 'AGC’. If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal; the IF-amplifier amplifies too much.

9.5 Video: TV Part (Diagrams B1, B2, and B3)

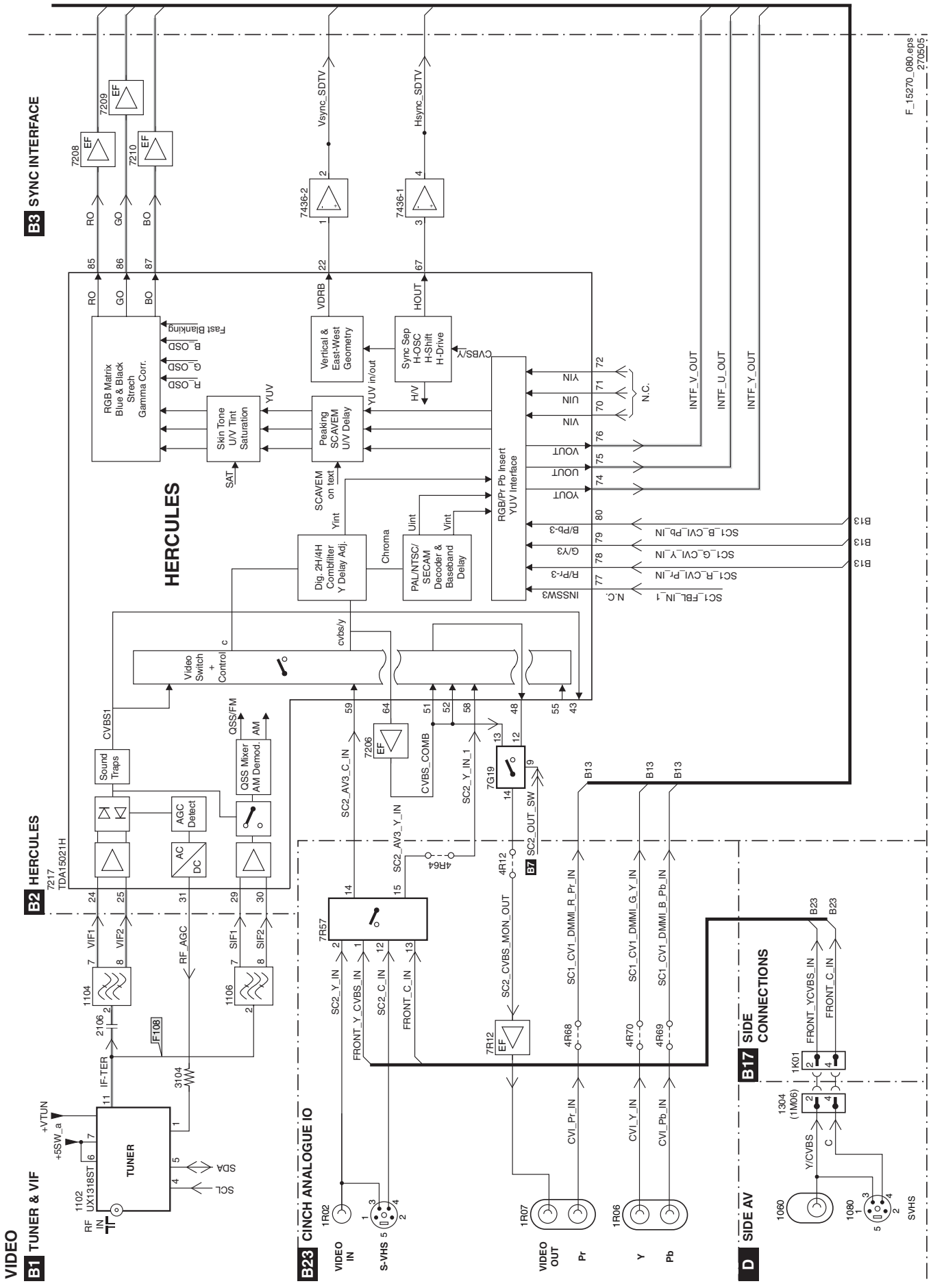


Figure 9-3 Block diagram video processing

The video processing is completely handled by the Hercules
- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also built-in features like:
- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

Further, it also incorporates sound IF traps and filters, and requires only one crystal for all systems.

9.6 Columbus

9.6.1 Introduction

The Columbus is a combination of:
- A **2D/3D Comb filter** for both PAL and NTSC, and
- A **spatial/temporal noise reduction system** for both colour and luminance signals.

The Columbus 3D Comb filter uses digitalised CVBS, U, and V (or C) signals and can be used with or without an external 16 Mbit SDRAM. Without external 16Mbit SDRAM, 3D comb filtering and temporal noise reduction are not possible.

The noise reduction part of the Columbus is controlled by the FBX software using the SNERT interface. The 2D/3D Comb filter part is controlled by the Main software using the I^2C bus.

9.6.2 2D/3D Comb Filter

Introduction
The “3D Comb filter Columbus” is a combined 2D/3D Comb filter function that is part of the Columbus chip (circuit diagram B19, item 7M00). It is a comb filter for both PAL and NTSC.

The 3D Comb filter is used to separate chroma and luminance components out of a CVBS signal. It is of no use when the CVBS signal is a SECAM signal (SECAM signals cannot be combed) The Columbus chip can be used with or without 16 Mbit external SDRAM (circuit diagram B10, item 7B01). When an external SDRAM is connected to the IC, the Comb filter function can work in combined 2D/3D processing (depending on the detected pixel based motion). When no external SDRAM is connected, only 2D Comb filtering is possible.

The Columbus can comb the following standard signals:
- PAL B, PAL G, PAL H, PAL I, PAL D, PAL K: Colour standard PAL, Colour carrier at 4.43 MHz, field frequency: 50 Hz
- PAL M: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 60 Hz
- PAL N: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 50 Hz
- NTSC M: Colour standard NTSC, Colour carrier at 3.58 MHz, field frequency: 60 Hz

For NTSC signals, the PAL delay line must always be bypassed.

The following signals CANNOT be combed:
- Double Window signals or Multi PIP. For these signals, only one part or even no part of the signal is in relation with the burst. The part that is not in relation with the burst can become very blurred when combed by the Columbus Comb filter. Such a signal must be bypassed. Notch mode is not even an option since e.g. in double window, one part can be a PAL signal while the other part is NTSC or SECAM.
- In cases where a SECAM signal is presented to the Columbus Comb filter; both the luminance and UV path must be bypassed. The PAL delay line inside the Columbus cannot be used for SECAM signals so it must also be bypassed. The luminance path must have luminance at its input instead of CVBS. A chroma delay line outside Columbus must be used for SECAM signals. Reason for this: the Columbus PAL delay line halves the output of the chroma signals in case of SECAM.
- Y/C, YPbPr, and RGB signals do not have to be combed. So both the luminance and UV path must be bypassed. The PAL delay line will also be bypassed.
- In cases where the Columbus Comb filter does not receive a CVBS signal with burst at the right place according to the standard (this includes black and white signals without burst), phase correction results become unpredictable and the Comb filter must be set in bypass (= luminance path bypassed, UV path bypassed, PAL delay line bypassed)
- VCR signals cannot be combed and must be processed in notch mode, or bypassed.

Columbus Modes
The several modes of the Columbus 3D Comb filter are:
- Bypass mode.
- Band-Pass-Notch mode.
- 2D Comb filter modes.
  - Simple median.
  - Median.
- Field Comb filter mode.
- Frame Comb filter mode.

Bypass Mode
The 3D Comb filter can be set in bypass mode. In this mode, the CVBS, U and V signals are just bypassed to the output.

Band-Pass-Notch Mode
This is a mode where no Comb filtering is applied. A “Band Pass Filter” is used to filter the chroma information out of the CVBS signal. A “Notch Filter” is used to subtract the sub carrier out of the CVBS in order to make a luminance signal without chroma sub carrier.
In terms of cross colour and cross luminance, this mode has the worst performance of all. It is only used on these signals where no comb filtering can be applied (non-standard signals and most VCR signals for example).

2D Comb Filter Modes
A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a line-delayed pixel, we talk about a “Spatial or 2D Comb Filter” (for NTSC the delay must be 1 line, for PAL it must be 2 lines).
Spatial or 2D Comb filters show problems on vertical colour transients and on single coloured lines. For these situations, extra hardware is added in the Columbus chip to avoid these kinds of problems. However even with these extra measures, there are still situations where the 2D Comb filter does not perform optimally (diagonal resolution and single lines with equal luminance content). In order to restrict the working area of the 2D Comb filter to the frequencies where the sub carrier is present, a horizontal band pass filter always precedes a 2D Comb filter.
When a 2D Comb filter has no extra hardware to avoid problems at vertical colour transients (or this extra hardware is switched “off”), the Comb filter is called a “simple median filter”. When there is extra hardware to avoid these kinds of problems, the filter is called a “median filter”.

Field Comb Filter Mode
A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a field-delayed pixel, we talk

about a “Field Comb Filter”. Field Comb filters are only for PAL of commercial interest.
Field Comb filters show also problems on vertical colour transients and on motion. For the vertical transients, a hanging dots detector has been added, however the performance on vertical transients of the field Comb filter, even with this hanging dots detector, is worse than the performance of the 2D Comb filter. On motion, the field Comb filter performs very badly. A motion detector must detect the pixels where there is motion and on these pixels, the Comb filter must be forced back to 2D Comb filter mode. This switching back is not implemented with a hard switch, but with a motion controlled fader. When there is a lot of motion, the fader will take a lot of the 2D Comb filter output, when there is less motion, more field-combed signal will be taken.
A field Comb filter is also called a “vertical-temporal filter” because it filters in the vertical and temporal direction.

Frame Comb Filter Mode
A Comb filter does an action on a current pixel and a delayed pixel. When the delay is a frame, we talk about a “Frame Comb Filter”. For NTSC we need a delay of one frame, for PAL however the delay must be two frames.
Frame Comb filters have the best performance, but just like the Field Comb filter, they perform very badly on motion. A motion detector will have to detect motion and on these motion pixels, 2D Comb filtering will have to be applied. A frame Comb filter is a pure “temporal filter”.
The Columbus needs an external memory connected to it, before it can do a temporal or vertical-temporal Comb filter action. When no external memory is connected, field or frame Comb filtering is impossible.

Block Diagram
In the next block diagram, two main parts of the Columbus 2D/3D Comb filter can be seen:

- The upper part is what is called the luminance Comb filter. It tries to make an as clean as possible luminance signal out of the CVBS signal at the input.
- The lower part receives U and V signals (sequentially) that are normally only band pass filtered in front of the 3D Comb filter. It filters all left over luminance signals out of it, in order to make an as clean as possible U and V signal.

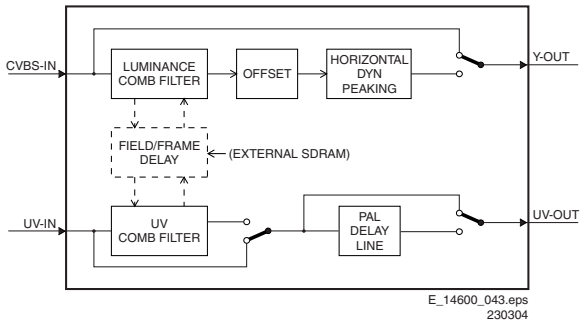


Figure 9-4 Columbus 2D/3D Comb Filter block diagram

The Comb filter has two inputs. One is the CVBS where clean luminance (Y) will be extracted from; the other one is UV where a clean U and V signal will be extracted. Both input signals are **digital** signals.

The field or frame delay is used for the Field and Frame Comb filter mode. An external memory connected to the Columbus IC provides this delay.

Phase correction is done at the inputs of both the Comb filter blocks. There is a phase correction for spatial filtering (called the spatial phase corrector) and a separate phase correction on the signals used for temporal (Frame or Field) Comb filtering (called the temporal phase corrector).

The offset block receives the motion dependant 2D/3D Comb filtered signal as input. The black level of the luminance signal is restored and the result is output. The black level restoration is corrected continuously. However, on VCR signals, this restoration can become unstable. Therefore, on VCR signals, a fixed black level restoration value must be forced.

A horizontal dynamic peaking can be done on the luminance signal. This peaking is adaptive in order not to amplify any cross luminance distortion. It detects where there could be left over sub carrier in the luminance signal and reduces the peaking over there. The detection of the left over cross luminance is different depending on the pre-filter or post-filter mode.
The amount of peaking and coring can be chosen. The peaking algorithm behind it is a simplified copy of the luminance peaking of picnic. After the peaking block, the signal is output as clean luminance.

The bypass switches have the obvious purpose of bypassing the input signal, in case no Comb filtering is wanted.

A PAL delay line is added in the UV path. This is done because a delay line in front of the 3D Comb filter does need an extra vertical filter action on the UV signals. This vertical filtering deteriorates the vertical transient performance for colours. The Columbus Comb filter cannot undo this. However, this reduction in performance can be omitted by putting the PAL delay line after the 3D Comb filter block.
For PAL signals, the PAL delay line in front of the Columbus 3D Comb filter is bypassed and the Columbus delay line is switched “on”. In cases where the delay line in front of Columbus cannot be bypassed, the Columbus PAL delay line is bypassed.
For NTSC signals, the PAL delay line is bypassed as usual.

9.6.3 Noise Reduction and Noise Estimator

The noise reduction function is a sophisticated successor of the noise reduction module from the PICNIC-chip, also known as “LIMERIC”.

Besides the noise reduction part, the Columbus noise reduction module also comprises a noise estimator. This noise estimator (the LORE-noise estimator) is a new design with the ambition of more accuracy and with less control complexity than the existing noise estimators.

9.7 Video: Scaler Part (Diagram B7, B8 and B9)

The Genesis gm1501 Scaler is a dual channel graphics and video processing IC for LCD and plasma monitors and televisions incorporating Picture in Picture, up to SXGA output resolutions. The Scaler controls the display processing in an LCD or plasma TV, e.g. like the deflection circuit in a CRT-based TV. It controls all the view modes (e.g. like "zooming" and "shifting"). Features like PC (VGA) or HD inputs, are also handled by this part.

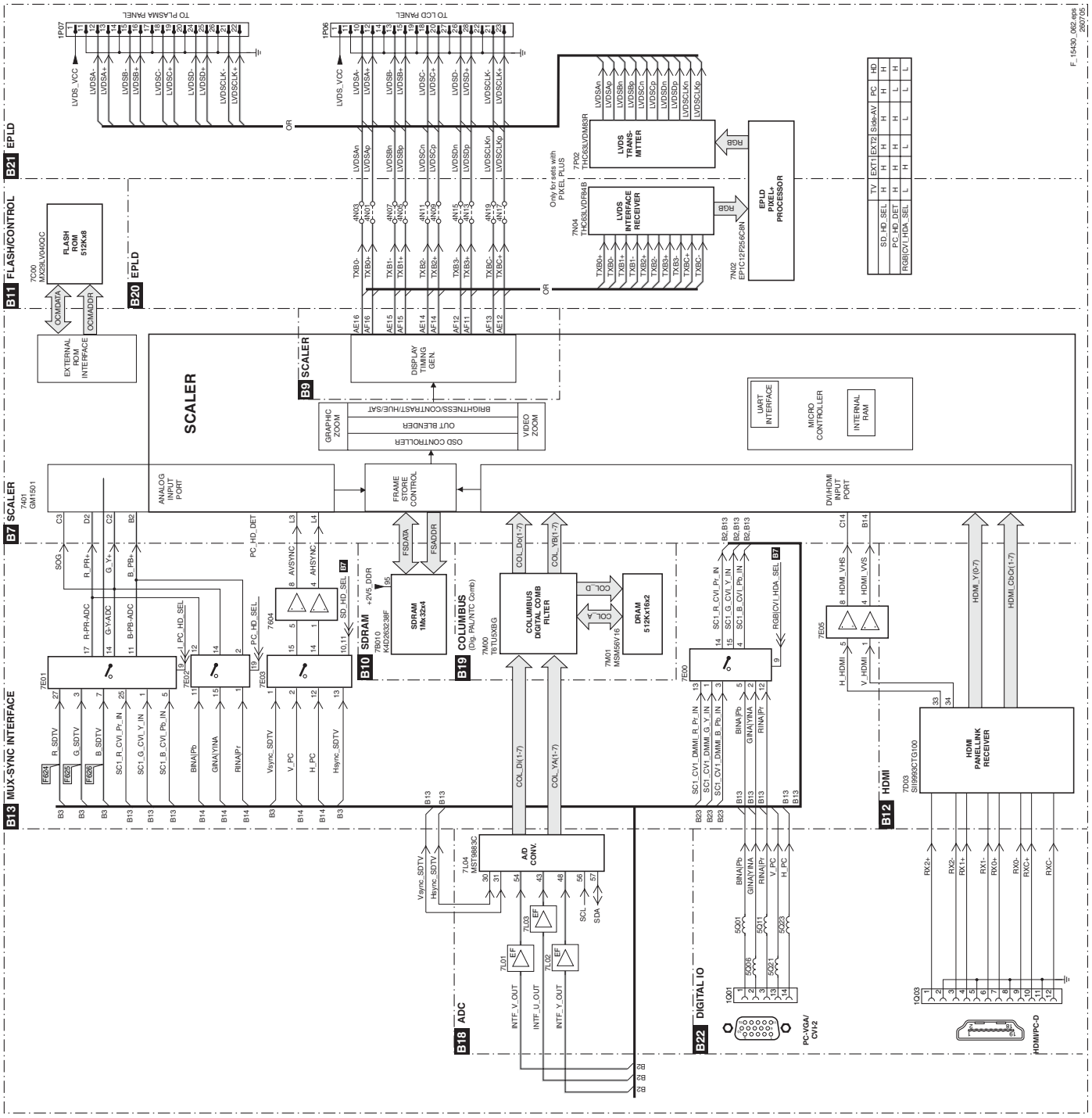


Figure 9-5 Block diagram scaler part

9.7.1 Teletext Path

In Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video signal (Columbus output), whereas the analogue RGB input input of the scaler is used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. In Crystal Clear models, which do not have an ADC and Columbus, the analogue RGB input of scaler is used for both video and teletext (generated by the Hercules). The digital input of the Scaler is not used in Crystal Clear TV sets. See also the block diagrams at the beginning of this chapter. When faultfinding, checking the teletext path may be useful: if there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty.

9.7.2 Features

The Scaler provides several key IC functions:

- Scaling.
- Auto-configuration/ Auto-Detection.
- Various Input Ports:
  - Analog RGB.
  - Video Graphics.
- Integrated LVDS Transmitter.
- On-chip Micro-controller

9.7.3 Inputs

Analog RGB

The RGB input is fed to pins B2, C2 and D2 of the Scaler IC (Genesis GM1501, item 7801, see circuit diagram B8). This input consists of either the Hercules RGB output or the RGB/ YpbPr input of the VGA connector. The Scaler can switch between the two signals via the PC_HD_SEL signal and selection IC SM5301 (see circuit diagram B13).

PC (VGA) Input

The VGA input is processed by the VGA block of the Scaler. The Scaler supports pixel frequencies up to 165MHz. YpbPr format is also supported via the VGA interface and covers a resolution of 480p/560p/720p/1080i.

9.7.4 Output

The Display Output Port provides data and control signals that permit the Scaler to connect to a variety of display devices using a TTL or LVDS interface. The output interface is configurable for single or dual wide TTL/LVDS in 18, 24 or 30-bit RGB pixels format. All display data and timing signals are synchronous with the DCLK output clock. The integrated LVDS transmitter is programmable to allow the data and control signals to be mapped into any sequence depending on the specified receiver format.

9.8 Audio Processing

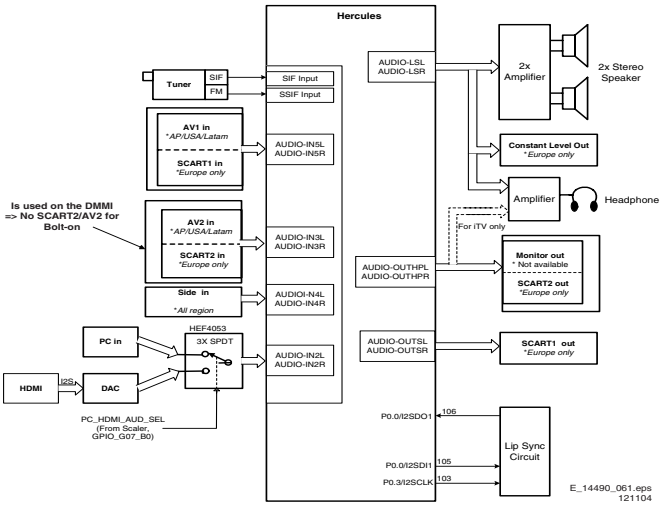


Figure 9-6 Block diagram audio processing

The audio decoding is done entirely via the Hercules. The IF output from the Tuner is fed directly to either the Video-IF or the Sound-IF input depending on the type of concept chosen. There are mainly two types of decoder in the Hercules, an analogue decoder that decodes only Mono, regardless of any standards, and a digital decoder (or DEMDEC) that can decode both Mono as well as Stereo, again regardless of any standards.

In this chassis, the analogue decoder is used in two cases:

- It is used for AM Sound demodulation in the Europe SECAM LL' transmission.
- It is used for all FM demodulation in AV-Stereo sets.

9.8.1 Diversity

The diversity for the Audio decoding can be broken up into two main concepts:

- The Quasi Split Sound concept used in Europe and some AP sets.
- The Inter Carrier concept, used in NAFTA and LATAM.

The UOC-III family makes no difference anymore between QSS- and Intercarrier IF, nearly all types are software-switchable between the two SAW-filter constructions.

Simple data settings are required for the set to determine whether it is using the Inter Carrier or the QSS concept. These settings are done via the "QSS" and "FMI" bit found in SAM mode. Due to the diversity involved, the data for the 2 bits are placed in the NVM location and it is required to write once during startup.

On top of that, it can be further broken down into various systems depending on the region. The systems or region chosen, will in turn affect the type of sound standard that is/are allowed to be decoded.

- For the case of Europe, the standard consists of BG/DK/I/ LL' for a Multi-System set. There are also versions of Eastern Europe and Western Europe set and the standard for decoding will be BG/DK and I/DK respectively. FM Radio (not applicable for the models discussed in this manual) is a feature diversity for some Europe TV sets. The same version can have either FM Radio or not, independent of the system (e.g. sets with BG/DK/I/LL' can have or not have FM radio).
- For the case of NAFTA and LATAM, there is only one transmission standard, which is the M standard. The diversity then will be based on whether it has a dBx noise reduction or a Non-dBx (no dBx noise reduction).

- For the case of AP, the standard consists of BG/DK/I/M for a Multi-System set. The diversity here will then depend on the region. AP China can have a Multi-System and I/DK version. For India, it might only be BG standard.

9.8.2 Functionality

The features available in the Hercules are as follows:
- Treble and Bass Control.
- Surround Sound Effect that includes:
  - Incredible Stereo.
  - Incredible Mono.
  - 3D Sound (not for AV Stereo).
  - TruSurround (not for AV Stereo).
  - Virtual Dolby Surround, VDS422 (not for AV Stereo).
  - Virtual Dolby Surround, VDS423 (not for AV Stereo).
  - Dolby Pro-Logic (not for AV Stereo).
- Bass Feature that includes:
  - Dynamic Ultra-Bass.
  - Dynamic Bass Enhancement.
  - BBE (not for AV Stereo).
- Auto-Volume Leveler.
- 5 Band Equalizer.
- Loudness Control.

All the features stated are available for the Full Stereo versions and limited features for the AV Stereo

9.8.3 Audio Amplifier

The audio amplifier part is very straightforward. It uses two integrated TDA8931T power amplifiers for the L and R channels; each amplifier IC is able to deliver a maximum output of 20 W_{RMS} continuously in a 4-6 ohm speaker without needing a heatsink.
The operating supply for the amplifier may range from 12 V to 32 V; in the LC04x TV set, depending on the model, supply voltages of 18 V (for the 5 W / 8 ohm version) or 24 V (for the 15 W / 4 ohm version) are used.
Muting is done via the SOUND_ENABLE line connected to pins 7 of both amplifier-ICs, which comes from the Hercules.

9.8.4 Audio: Lip Sync

No Lip Sync adjustments are neccessary in this model.

9.9 Control

9.9.1 Hercules

The System Board has two main micro-controllers on board. These are:
- On-chip x86 micro-controller (OCM) from Genesis LCD or plasma TV/Monitor Controller.
- On-chip 80C51 micro-controller from Philips Semiconductor UOCIII (Hercules) series.

Each micro-controller has it own I^2C bus which hosts its own internal devices.
The Hercules is integrated with the Video and Audio Processor. For dynamic data storage, such as SMART PICTURE and SMART SOUND settings, an external NVM IC is being used. Another feature includes an optional Teletext/Closed Caption decoder with the possibility of different page storage depending on the Hercules type number.

9.9.2 Block Diagram

The block diagram of the Micro Controller application is shown below.

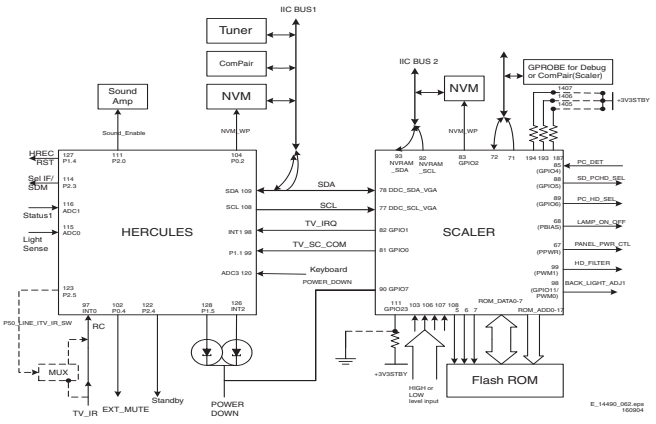


Figure 9-7 Micro Controller block diagram

9.9.3 Basic Specification

The Micro Controller operates at the following supply voltages:
- +3.3 V_{DC} at pins 4, 88, 94, and 109.
- +1.8 V_{DC} at pins 93, 96, and 117.
- I^2C pull up supply: +3.3V_{DC}.

9.9.4 Pin Configuration and Functionality

The ports of the Micro Controller can be configured as follows:
- A normal input port.
- An input ADC port.
- An output Open Drain port.
- An output Push-Pull port.
- An output PWM port.
- Input/Output Port

The following table shows the ports used for the LC04 control:

Table 9-2 Micro Controller ports overview

Pin	Name	Description	Configuration
97	INT0/ P0.5	IR	INT0
98	P1.0/ INT1	TV_IRQ	INT2
99	P1.1/ T0	TV_SC_COM	P1.1
102	P0.4/ I2SWS	EXT_MUTE	P0.4
103	P0.3/ I2SCLK	Lip Sync	I2SCLK
104	P0.2/ I2SDO2	NVM_WP	P0.2
105	P0.1/ I2SDO1	Lip Sync	I2SDO1
106	P0.0/ I2SDI/O	Lip Sync	I2SDI/O
107	P1.3/ T1	PC-TV_LED	P1.3
108	P1.6/ SCL	SCL	SCL
109	P1.7/ SDA	SDA	SDA
111	P2.0/ TPWM	SOUND_ENABLE	P2.0
112	P2.1/ PWM0	(for future use)	-
113	P2.2/ PWM1	(for future use)	-
114	P2.3/ PWM2	SEL_IF	P2.3
115	P3.0/ ADC0	Light Sensor - SDM	ADC0
116	P3.1/ ADC1	STATUS_1	ADC1
119	P3.2/ ADC2	STATUS_2	ADC2
120	P3.3/ ADC3	KEYBOARD	ADC3
122	P2.4/ PWM3	STANDBY	P2.4
123	P2.5/ PWM4	(for future use)	-
126	P1.2/ INT2	(for future use)	-
127	P1.4/ RX	HERC_RESET	-
128	P1.5/ TX	POWER_DOWN	P1.5

The description of each functional pin is explained below:

- **LED.** This signal is used as an indication for the Standby, Remote and Error Indicator. Region diversity:
  - During protection mode, the LED blinks and the set is in standby mode.
  - During error conditions it blinks at a predefined rate.
  - After receiving a valid RC-5 or local keyboard command it flashes once.
  - For sets with error message indication, the LED blinks when message is active and the set is in standby mode.
- **SCL.** This is the clock wire of the two-wire single master bi-directional I^2C bus.
- **SDA.** This is the data wire of the two-wire single master bi-directional I^2C bus.
- **STANDBY.** The Hercules generates this signal. This can enable the power supply in normal operation and disable it during Standby. It is of logic “high” (3.3 V) under normal operation and “low” (0 V) during Standby.
- **IR.** This input pin is connected to an RC5 remote control receiver.
- **SEL-IF.** This is an output pin to switch the Video SAW filter between M system and other systems.
  - 0: NTSC M (default)
  - 1: PAL B/G, DK, I, L
- **NVM_WP.** The global protection line is used to enable and disable write protection to the NVM. When write to the NVM is required, pin 7 of the NVM must be pulled to logic ‘0’ first (via Write_Protect of the micro-controller pin) before a write is performed. Otherwise pin 7 of NVM must always be at logic “1”
  - 0: Disabled
  - 1: Enabled (default)
- **SOUND_ENABLE.** This pin is used to MUTE the audio amplifier. It is configured as push pull.
- **STATUS_1.** This signal is used to read the status of the SCART 1 input.
- **STATUS_2.** This signal is used to read the status of the SCART 2 input.
- **HERC_RESET.** This pin is used to switch the +1.8V supply.
- **POWER_DOWN**. The power supply generates this signal. Logic “high” (3.3 V) under normal operation of the TV and goes “low” (0 V) when the Mains input voltage supply goes below 70 V_{AC}.
- **KEYBOARD**. Following are the Keyboard functions and the step values (8 bit) for it.

Table 9-3 Local keyboard values

Function	Voltage (V_{DC})	Step values (8 bit)
NAFTA Standby	0	0 - 6
Ch +	0.43	7 - 33
Exit Factory (Ch- and Vol-)	0.69	34 - 53
Ch -	0.93	54 - 73
Menu (Vol - and Vol +)	1.19	74 - 96
Vol -	1.49	97 - 121
DVD Eject (not applicable)	1.8	122 - 147
Vol +	2.12	148 - 169

- **TV_IRQ.** This signal is the interrupt from the Scaler IC.
- **TV_SC_COM.** This signal is used for the communication with the Scaler IC.
- **EXT_MUTE.** This signal is used to reduce the Switch-off plop.

9.10 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format
1080i	1080 visible lines, interlaced
1080p	1080 visible lines, progressive scan
2CS	2 Carrier Sound (or 2 Channel Stereo)
480i	480 visible lines, interlaced
480p	480 visible lines, progressive scan
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control; Control signal used to tune and lock to the correct frequency
AGC	Automatic gain control (feedback) signal to the tuner. This circuit ensures a constant output amplitude regardless of the input amplitude
AM	Amplitude Modulation; A "data encoding to a carrier" method, such that the carrier amplitude is proportional to the data value
AP or A/P	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AV	External Audio Video
B-SC1-IN	Blue SCART1/EXT1 in
B-SC2-IN	Blue SCART2/EXT2 in
B-TXT	Blue TeleteXT
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz. B= VHF-band, G= UHF-band
BOCMA	Bimos one Chip Mid-end Architecture: video and chroma decoder
C-FRONT	Chrominance front input
CBA	Circuit Board Assembly (also called PCB or PWB)
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look-Up Table
COLUMBUS	COLour LUMinance Baseband Universal Subsystem. IC performing noise reduction and 2D/3D comb filtering
ComPair	Computer aided rePair. A tool for diagnosing a TV through a PC controlled interface
CSM	Customer Service Mode
CVBS	Composite Video and Blanking Signal; A single video signal that contains luminance, colour, and timing information
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)
CVBS-INT	CVBS signal from internal Tuner
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS TERrestrial OUTput signal
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DFU	Directions For Use: Owner's manual
DNR	Dynamic Noise Reduction / Digital Noise Reduction; Noise reduction feature of the set
DRAM	Dynamic RAM; dynamically refreshed RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool; Special remote control designed for dealers to enter

	e.g. service mode (a DST-emulator is available in ComPair)
DTS	Digital Theatre System; A multi-channel surround sound format, similar to Dolby Digital
DVD	Digital Versatile Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory
EPLD	Erasable Programmable Logic Device
EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView)
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast BLanking; DC signal accompanying RGB signals. To blank the video signal when it is returning from the right side of the screen to the left side. The video level is brought down below the black video level
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in
FBL-TXT	Fast Blanking Teletext
FM	Field Memory; A memory chip that is capable of storing one or more TV picture fields / Frequency Modulation; A technique that sends data as frequency variations of a carrier signal
FMR	Radio receiver that can receive the FM Band 87.5 - 108 MHz
FRC	Frame Rate Converter
FRONT-C	Front input chrominance (SVHS)
FRONT-DETECT	Control line for detection of headphone insertion, Service Mode jumper, power failure detection
FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
G-SC1-IN	Green SCART1/EXT1 in
G-SC2-IN	Green SCART2/EXT2 in
G-TXT	Green teletext
H	H_sync to the module
HA	Horizontal Acquisition; horizontal sync pulse
HD	High Definition
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz. VHF- and UHF-band
I^2C	Integrated IC bus
I^2S	Integrated IC Sound bus
IC	Integrated Circuit
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
IR	Infra Red
IRQ	Interrupt ReQuest
Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	LATin AMerica
LC04	Philips chassis name for LCD TV 2004 project
LCD	Liquid Crystal Display
LED	Light Emitting Diode; A semiconductor diode that emits light when a current is passed through it
LINE-DRIVE	Horizontal (line) deflection drive signal (for the Line transistor)
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	LoudSpeaker
LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz. M= 525 lines @ 60 Hz, N= 625 lines @ 50 Hz
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group. An ISO/IEC body that has given its name to an image compressing scheme for moving video
MSP	Multi-standard Sound Processor: ITT sound decoder
MUTE	MUTE Line
NC	Not Connected
NICAM	Near Instantaneously Companded Audio Multiplexing; This is a digital sound system, mainly used in Europe
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory; IC containing data such as alignment values, preset stations
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OSD	On Screen Display
PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PC	Personal Computer
PCB	Printed Circuit Board (or PWB)
PIG	Picture In Graphic
PIP	Picture In Picture
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PWB	Printed Wiring Board (also called PCB or CBA)
RAM	Random Access Memory
RC	Remote Control transmitter
RC5 or 6	Remote Control system 5 or 6, the signal from the remote control receiver
RGB	Red, Green, and Blue colour space; The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	SandCastle: two-level pulse derived from sync signals
SC-IN	SCART in
SC-OUT	SCART out
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et

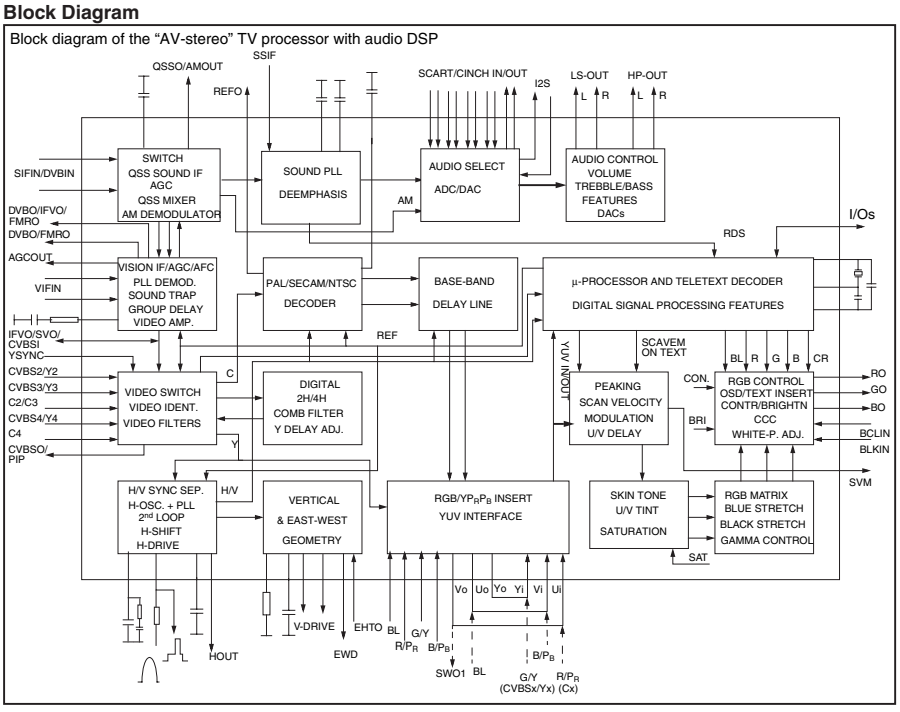
	Téléviseurs; This is a 21-pin connector used in EU, that carries various audio, video, and control signals (it is also called Péritel connector)
SCL	Serial CLock Signal on I^2C bus
SD	Standard Definition
SDA	Serial DAta Signal on I^2C bus
SDRAM	Synchronous DRAM
SECAM	SÉquence Couleur Avec Mémoire; Colour system mainly used in France and East Europe. The chroma is FM modulated and the R-Y and B-Y signals are transmitted line sequentially. Colour carriers= 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SND	SouND
SNDL-SC1-IN	Sound left SCART1 in
SNDL-SC1-OUT	Sound left SCART1 out
SNDL-SC2-IN	Sound left SCART2 in
SNDL-SC2-OUT	Sound left SCART2 out
SNDR-SC1-IN	Sound right SCART1 in
SNDR-SC1-OUT	Sound right SCART1 out
SNDR-SC2-IN	Sound right SCART2 out
SNDR-SC2-OUT	Sound right SCART2 out
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace; This is a consumer interface used to transfer digital audio
SRAM	Static RAM
STBY	STandBY
SVHS	Super Video Home System
SW	Software or Subwoofer or Switch
THD	Total Harmonic Distortion
TXT	Teletext; TXT is a digital addition to analogue TV signals that contain textual and graphical information (25 rows x 40 columns). The information is transmitted within the first 25 lines during the Vertical Blank Interval (VBI)
µP	Microprocessor
VA	Vertical Acquisition
VL	Variable Level out: processed audio output towards external amplifier
VCR	Video Cassette Recorder
VGA	Video Graphics Array; 640x480 (4:3)
WD	Watch Dog
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
Y	Luminance signal
Y/C	Y consists of luminance signal, blanking level and sync; C consists of chroma (colour) signal
YPbPr	This is a scaled version of the YUV colour space. Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV
YUV	Colour space used by the NTSC and PAL video systems. Y is the luminance and U/V are the colour difference signals

9.11 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.11.1 Diagram B2, Type TDA15021H (IC7217, Hercules)

Block Diagram



Pin Configuration

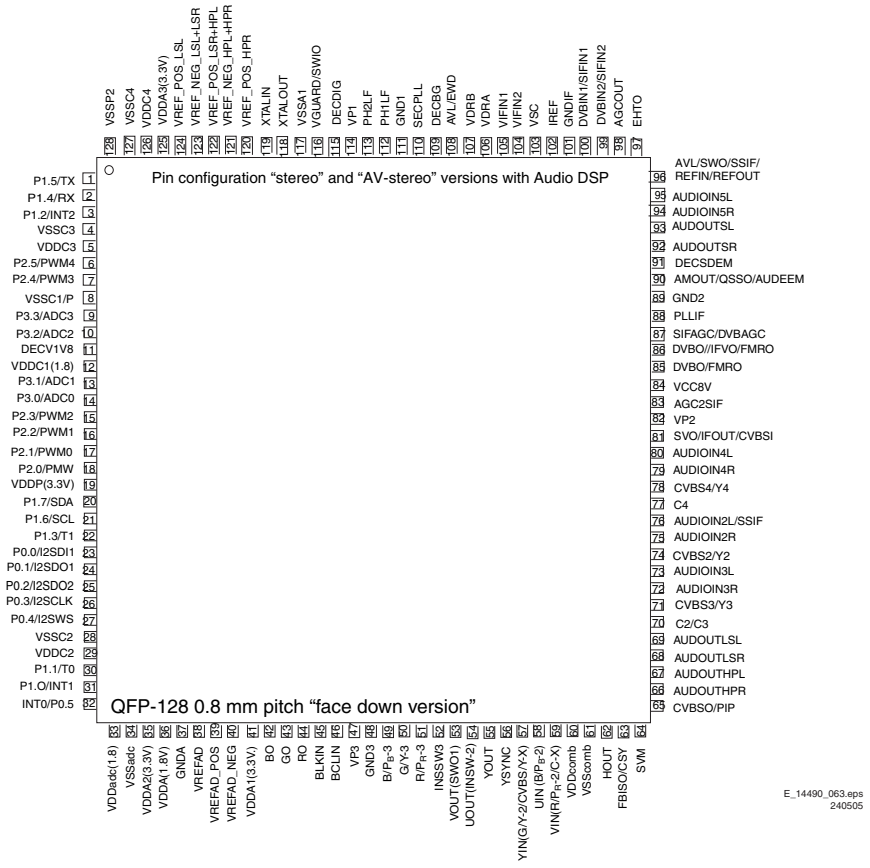


Figure 9-8 Internal block diagram and pin configuration

9.11.2 Diagram B19, Type T6TU5XB (IC7M00, Columbus)

Figure 1 Package outline (top view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	WEB/ DAVB	UVA0 /Di0	UVA2 /Di2	UVA4 /Di4	UVA6 /Di6	UVA8 /Di8	SEL656	TST1	YA2	YA4	YA6	YA8	VA	HREF	SDA	A
B	YB8	VSS	UVA1 /Di1	UVA3 /Di3	UVA5 /Di5	UVA7 /Di7	YA0 /Di9	BISTEN	YA1	YA3	YA5	YA7	WEA/ DAVA	VSS	SCL	B
C	YB7	YB6	VSS	VDDS	VSS	VSS	VDDC	VDDC	VSS	VSS	VDDC	VDDS	VSS	SNDA	SNRST	C
D	YB5	YB4	VDDC	N.C.									VSS	SNCL	TCK	D
E	YB3	YB2	VSS										VDDC	TMS	TDO	E
F	TST2	YB1	VSS										VSS	TRST	TDI	F
G	CLKASB	YB0 /Do9	VDDS					COLUMBUS TOP-VIEW					VDDS	A0ICC	RESET	G
H	CLKASA	UVB8/ Do8	TST3										VDDC	CLK EXT	CLKSEL	H
J	UVB7 /Do7	UVB6/ Do6	VSS					PPA Version 2.7					VSS	CLK	WEN	J
K	UVB5 /Do5	UVB4/ Do4	VDDC										VSS	CASN	RASN	K
L	UVB3 /Do3	UVB2 /Do2	VSS										VDDS	DQM	DQ16	L
M	UVB1 /Do1	UVB0 /Do0	VDDS										VSS	DQ14	DQ15	M
N	AVD	N.C.	VDDS	VSS	VSS	VDDC	VSS	VDDS	VDDC	VSS	VDDS	VSS	VSS	VDDS	DQ13	N
P	AVS	VSS	A7	A9	A2	A0	A11	DQ7	DQ6	DQ4	DQ3	DQ1	VDDS	VSS	DQ12	P
R	A4	A5	A6	A8	A3	A1	A10	DQ8	VSS	DQ5	VSS	DQ2	DQ9	DQ10	DQ11	R
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

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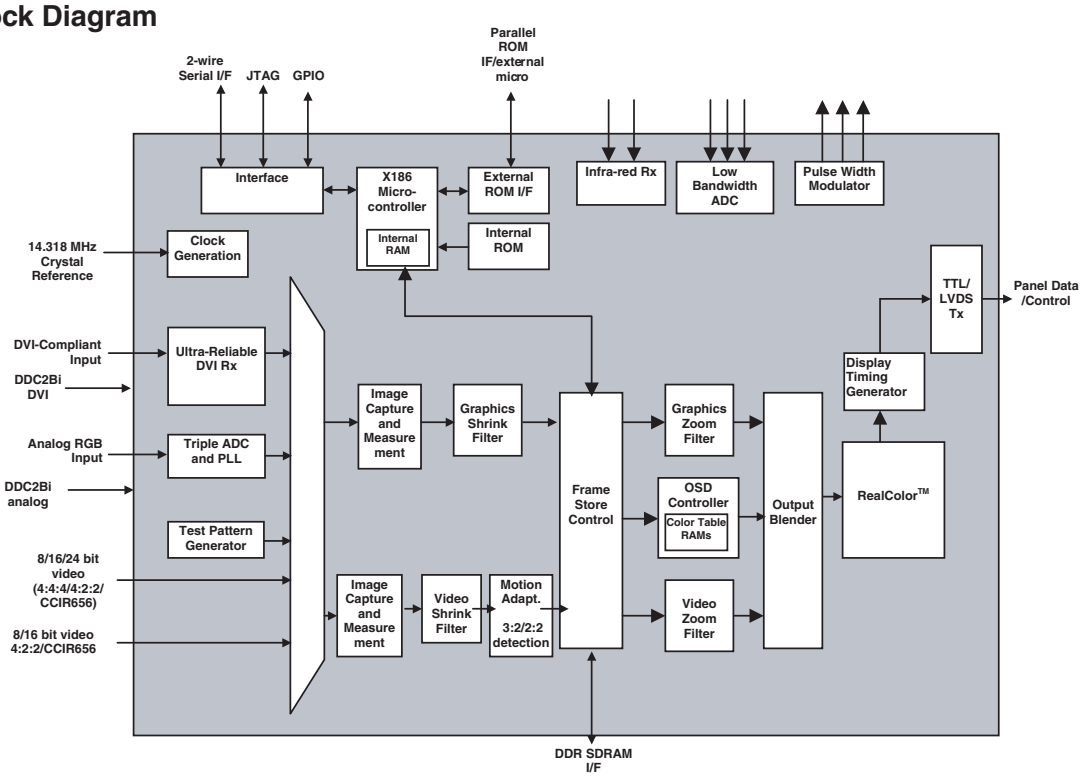
200804

Figure 9-9 Pin configuration

9.11.3 Diagram B7+B8+B9, Type GM1501 (IC7401, Genesis)

Block Diagram



Pin Configuration

	1	2	3	4	5	6	7	8	9	10	11	12	13
A	NC	ADC_3.3	ADC_1.8	ADC_1.8	ADC_DGND	RXC+	DVI_GND	RX0+	RX1+	RX2+	DVI_GND	LBADC_N3	D_GND
B	BLUE-	BLUE+	ADC_3.3	ADC_DGND	DVI_GND	RXC-	DVI_GND	RX0-	RX1-	RX2-	REXT	LBADC_N2	D_GND
C	GREEN-	GREEN+	SOG	ADC_AGND	NC	DVI_3.3	DVI_GND	DVI_3.3	DVI_3.3	DVI_3.3	DVI_3.3	LBADC_N1	LBADC_33
D	RED-	RED+	ADC_3.3	ADC_AGND	NC	DVI_1.8	DVI_GND	DVI_1.8	DVI_1.8	DVI_1.8	DVI_GND	LBADC_ RETURN	LBADC_GND
E	ADC_AGND	ADC_AGND	ADC_3.3	ADC_AGND									
F	NC	VDDD33_ PLL	VSSA33_ RPLL	VDDA33_ RPLL									
G	VDDA33_ FPLL	VSSD33_ PLL	TCLK	XTAL									
H	VDDD33_ SDDS	VSSA33_ SDDS	VDDA33_ SDDS	VSSA33_ FPLL									
J	VDDD33_ DDDS	VSSA33_ DDDS	VDDA33_ DDDS	VSSD33_ SDDS									
K	RESETn	ACS_ RSET_HD	NC	VSSD33_ DDDS						CORE_1.8	CORE_1.8	D_GND	D_GND
L	OCM_INT2	OCM_INT1	AVSYNC	AHSYNC						D_GND	CORE_1.8	D_GND	D_GND
M	OCM_UDO	OCM_UDI	IR0	IR1						D_GND	D_GND	D_GND	D_GND
N	VGA_SDA	VGA_SCL	DVI_SDA	DVI_SCL						D_GND	D_GND	D_GND	D_GND
P	OCM_CS1n	OCM_CS2n	MSTR_SDA	MSTR_SCL						D_GND	D_GND	D_GND	D_GND
R	ROM_CSn	OCM_REn	OCM_WEn	EXTCLK						D_GND	D_GND	D_GND	D_GND
T	OCMADDR 17	OCMADDR 18	OCMADDR 19	OCM_CS0n						D_GND	CORE_1.8	D_GND	D_GND
U	OCMADDR 13	OCMADDR 14	OCMADDR 15	OCMADDR 16						CORE_1.8	CORE_1.8	D_GND	D_GND
V	OCMADDR 9	OCMADDR 10	OCMADDR 11	OCMADDR 12									
W	OCMADDR 6	OCMADDR 7	OCMADDR 8	IO_3.3									
Y	OCMADDR 3	OCMADDR 4	OCMADDR 5	IO_3.3									
AA	OCMADDR 0	OCMADDR 1	OCMADDR 2	IO_3.3									
AB	OCMDATA13	OCMDATA14	OCMDATA15	IO_3.3									
AC	OCMDATA10	OCMDATA11	OCMDATA12	IO_3.3	GPIO_G09_B2 (DEGRN0)	IO_3.3	DCLK	IO_3.3	GPIO_G07_B2 (DERED4)	IO_3.3	SHIELD[1] (DEGRN3)	LVDSB_3.3	LVDSB_GND
AD	OCMDATA9	OCMDATA6	OCMDATA3	OCMDATA0	GPIO_G09_B3 (DEGRN1)	GPIO_G08_B0 (DORED0)	DEN	GPIO_G08_B5 (DOBLU1)	GPIO_G07_B3 (DERED5)	GPIO_G07_B6 (DERED8)	SHIELD[2] (DEGRN4)	LVDSB_3.3	LVDSB_3.3
AE	OCMDATA8	OCMDATA5	OCMDATA2	GPIO_G09_B0 (DERED0)	GPIO_G09_B4 (DEBLU0)	GPIO_G08_B1 (DORED1)	GPIO_G08_B3 (DOGRN1)	GPIO_G07_B0 (DERED2)	GPIO_G07_B4 (DERED6)	GPIO_G07_B7 (DERED9)	SHIELD[3] (DEGRN5)	BC+ (DEGRN8)	SHIELD[4] (DEBLU2)
AF	OCMDATA7	OCMDATA4	OCMDATA1	GPIO_G09_B1 (DERED1)	GPIO_G09_B5 (DEBLU1)	GPIO_G08_B2 (DOGRN0)	GPIO_G08_B4 (DOBLU0)	GPIO_G07_B1 (DERED3)	GPIO_G07_B5 (DERED7)	SHIELD[0] (DEGRN2)	B3+ (DEGRN6)	B3- (DEGRN7)	BC- (DEGRN9)

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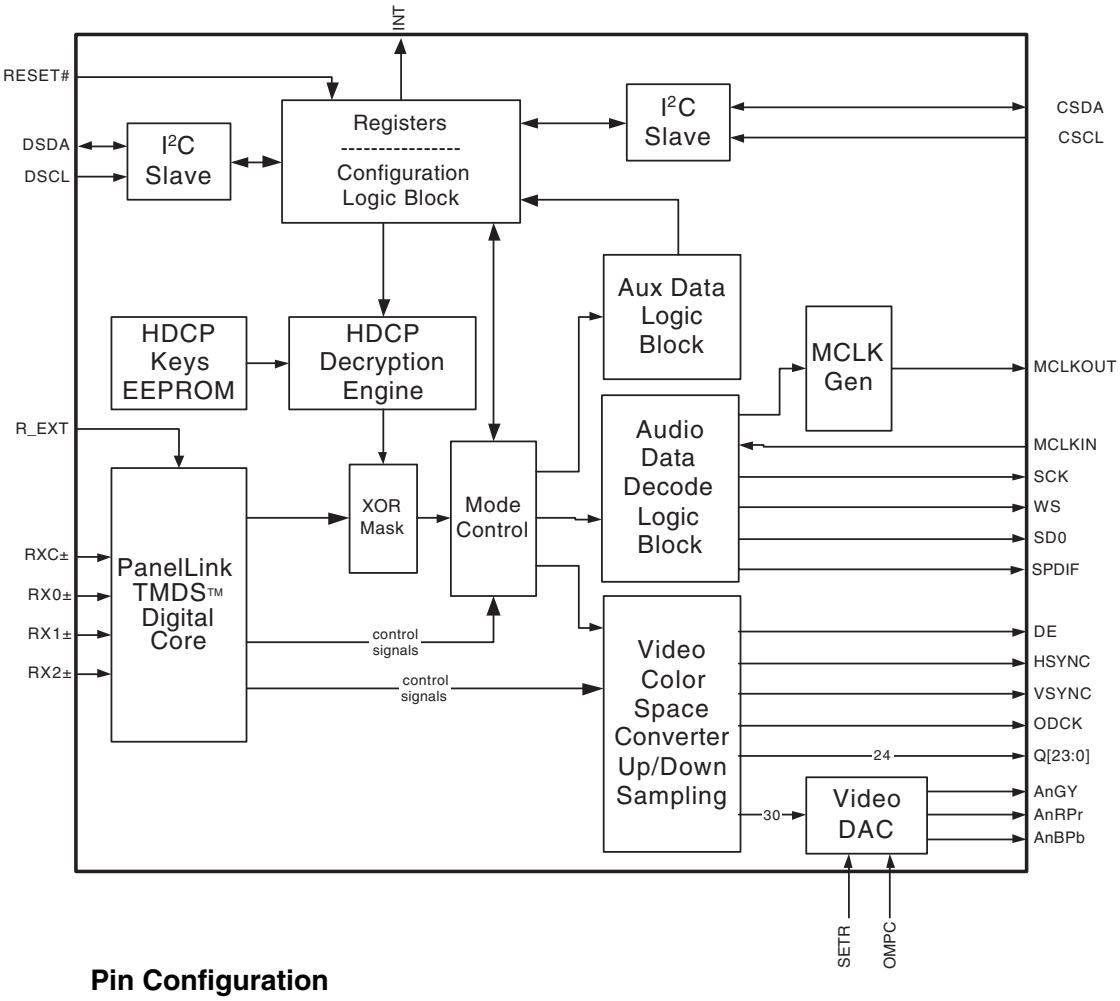
241204

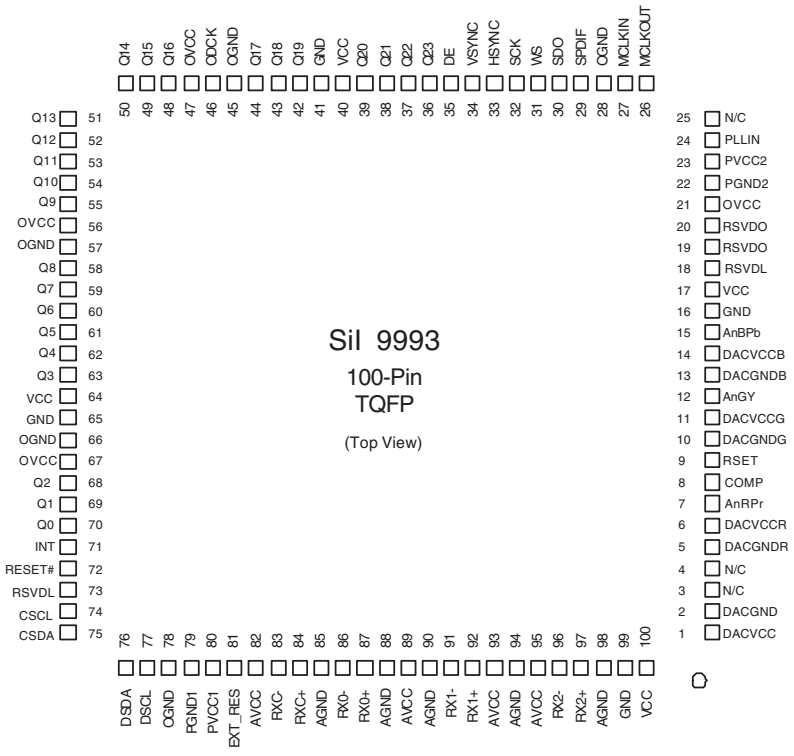
Figure 9-10 Internal block diagram and pin configuration

9.11.4 Diagram B12, Type S9993CT (IC7D03, HDMI Panellink), Reserved

Block Diagram



Pin Configuration



E_14620_149.eps
170305

Figure 9-11 Internal block diagram and pin configuration

10. Spare Parts List

Set Level

Various

1004	8204 000 78181	PDP S42SD-YD07
1004▲	9322 224 88682	PDP PDP42V7A062
1012	3104 328 39571	LED panel LC04SD2
8102	3104 311 03601	Cable 7p/400/7p
8102	3104 311 07241	Cable 7P/1000/7P
8103	3104 311 06511	Cable 10p/280/10p
8103	3104 311 07391	Cable 10P/220/10P
8120▲	3104 311 07421	Cable 6P/680/6P
8146	3104 311 08621	Cable 11P/220/11P
8150	3104 311 08831	Cable 31P/300/31P
8150	3104 311 10493	Cable 31P/220/31P
8152▲	3104 311 09921	Cable 9P/680/9P
8900▲	3104 311 07911	Cable ring/180/ring

Set Level

Various

1014	3104 328 39561	Side control LC04SD2
1116	3104 328 40501	Side I/O Assy LC04SD2
8101	3104 311 10751	Cable 3P/1K7/3P
8136	3104 311 10733	Cable 11P/1K/11P
8735	3104 311 10601	Cable 2P3/1400/POSI
8736	3104 311 10591	Cable 2P3/1000/POSI

⎓

5213	2441 257 30020	Loudspeaker 8Ω 10W
5214	2441 257 30020	Loudspeaker 8Ω 10W

Small Signal Board [B]

Various

1062	2422 549 00148	Socket 3p m
1062▲	2422 549 00151	Socket 3p m
1101	2422 025 18749	Connector 3p m
1102	3139 147 19801	Tuner UV1318S/A IH -3
1104	2422 549 44372	SAW 38.9MHz K3953L
1106	2422 549 44369	SAW 38.9MHz K9656L
1107	2422 025 18749	Connector 3p m
1202	2422 543 01414	Xtal 24.576MHz
1801	2422 543 01133	Xtal 14.32MHz 20pF
1F00	2422 033 00515	Socket DVI-I 29p f
1F01	2422 026 05703	Socket 1P f
1G01	2422 025 18959	Socket 21P f shd
1G02	2422 025 18959	Socket 21P f shd
1J00	2422 025 10771	Connector 10p m
1J01	2422 025 10655	Connector 11p m
1J04	2422 025 10769	Connector 9p m
1J07▲	2422 086 11081	Fuse T3A 125V
1J08▲	2422 086 11105	Fuse F630mA 50V
1K00	2422 025 08149	Connector 6p m
1K02	2422 025 10768	Connector 3p m
1K04	2422 025 10655	Connector 11p m
1N01	2422 025 17274	Connector 10p m
1N02	2422 025 18779	Connector 4P m
1N05	2722 171 08825	Xtal 14.31818Mhz 15pF
1P01	2422 549 45325	Bead 67Ω at 100MHz
1P02	2422 549 45325	Bead 67Ω at 100MHz
1P03	2422 549 45325	Bead 67Ω at 100MHz
1P04	2422 549 45325	Bead 67Ω at 100MHz
1P05	2422 549 45325	Bead 67Ω at 100MHz
1P07	2422 025 18427	Connector 31p f
8321	3104 311 08731	Cable POSI/100/POSI

⊣⊢

2101	4822 124 12095	100µF 20% 16V
2102	5322 126 11583	10nF 10% 50V 0603
2103	5322 126 11583	10nF 10% 50V 0603
2104	4822 122 33761	22pF 5% 50V
2105	4822 122 33761	22pF 5% 50V
2106	5322 126 11583	10nF 10% 50V 0603
2107	3198 024 44730	47nF 50V 0603
2109	5322 124 41945	22µF 20% 35V
2113	4822 124 12095	100µF 20% 16V
2203	4822 124 23002	10µF 16V
2206	2020 552 00035	2.2µF 6.3V 10% 0603
2207	2020 552 96718	220nF 10% 6.3V 0402
2208	4822 124 12084	1µF 20% 50V
2209	4822 124 23002	10µF 16V
2210	2020 552 96718	220nF 10% 6.3V 0402
2211	2020 552 96628	10nF 10% 16V 0402
2214	2020 552 96618	1nF 10% 50V 0402
2216	2020 552 96618	1nF 10% 50V 0402
2218	3198 035 71040	100nF 10% 16V 0402
2221	4822 124 12095	100µF 20% 16V
2223	2238 869 15101	100pF 5% 50V 0402
2225	2020 552 96618	1nF 10% 50V 0402
2226	3198 035 03320	3.3nF 5% 50V 0402
2227	2020 552 96618	1nF 10% 50V 0402
2228	3198 035 71040	100nF 10% 16V 0402
2230	3198 035 71040	100nF 10% 16V 0402
2231	2020 552 96718	220nF 10% 6.3V 0402
2232	3198 035 71040	100nF 10% 16V 0402
2233	4822 124 23002	10µF 16V
2234	2020 552 96718	220nF 10% 6.3V 0402
2235	2020 552 96718	220nF 10% 6.3V 0402
2236	4822 126 14076	220nF +80/-20% 25V
2237	2020 552 96718	220nF 10% 6.3V 0402
2238	2020 552 96718	220nF 10% 6.3V 0402
2239	3198 035 71040	100nF 10% 16V 0402
2240	2020 552 96718	220nF 10% 6.3V 0402
2241	2020 552 96718	220nF 10% 6.3V 0402
2242	3198 035 71040	100nF 10% 16V 0402
2243	4822 124 23002	10µF 16V
2244	3198 035 71040	100nF 10% 16V 0402
2245	3198 035 71040	100nF 10% 16V 0402
2246	3198 035 71040	100nF 10% 16V 0402
2250	2020 552 96618	1nF 10% 50V 0402
2251	2020 552 96656	10µF 20% 25V 1210
2252	3198 035 71040	100nF 10% 16V 0402
2253	3198 035 71040	100nF 10% 16V 0402
2254	3198 035 71040	100nF 10% 16V 0402
2255	3198 035 71040	100nF 10% 16V 0402
2256	4822 124 23002	10µF 16V
2257	3198 035 71040	100nF 10% 16V 0402
2258	2020 552 96637	10µF 10% 6.3V 0805
2259	3198 035 71040	100nF 10% 16V 0402
2260	2020 552 96637	10µF 10% 6.3V 0805
2262	4822 124 12082	10µF 20% 50V
2263	3198 035 26820	6.8nF 10% 16V 0402
2264	3198 017 44740	470nF 10V 0603
2265	3198 017 41050	1µF 10V 0603
2266	3198 035 71040	100nF 10% 16V 0402
2267	2020 552 96718	220nF 10% 6.3V 0402
2269	2020 012 00003	470µF 16V 20% SMD
2270	3198 035 71040	100nF 10% 16V 0402
2271	4822 124 12095	100µF 20% 16V
2272	3198 035 71040	100nF 10% 16V 0402
2273	2020 552 96718	220nF 10% 6.3V 0402
2274	3198 017 31540	150nF 10V 0603
2277	3198 035 71040	100nF 10% 16V 0402
2280	2020 552 00027	4.7µF 2% 6.3V 0603
2281	2020 552 00027	4.7µF 2% 6.3V 0603
2285▲	3198 035 71040	100nF 10% 16V 0402
2286	3198 035 71040	100nF 10% 16V 0402
2289▲	4822 051 30151	150Ω 5% 0.062W
2290▲	2222 240 59872	4.7µF 5% 10V 0805
2291▲	3198 035 71040	100nF 10% 16V 0402
2449	3198 035 71040	100nF 10% 16V 0402
2501	3198 035 71040	100nF 10% 16V 0402
2502	3198 035 71040	100nF 10% 16V 0402
2503	3198 035 71040	100nF 10% 16V 0402
2504	3198 035 71040	100nF 10% 16V 0402
2505	3198 035 71040	100nF 10% 16V 0402
2506	3198 035 03310	330pF 5% 50V 0402
2507	3198 035 04710	470pF 50V 0402
2508	2238 869 15829	82pF 5% 50V 0402
2509	2238 869 15829	82pF 5% 50V 0402
2603	2020 552 96834	1µF 20% 6.3V 0402
2604	3198 035 04710	470pF 50V 0402
2605	2020 552 96834	1µF 20% 6.3V 0402
2608	2020 552 96834	1µF 20% 6.3V 0402
2609	3198 035 04710	470pF 50V 0402
2610	2020 552 96834	1µF 20% 6.3V 0402
2611	4822 124 12095	100µF 20% 16V
2612	3198 017 41050	1µF 10V 0603
2614	3198 035 71040	100nF 10% 16V 0402
2615	2020 012 00003	470µF 16V 20% SMD
2618	2020 012 00003	470µF 16V 20% SMD
2704	4822 124 23002	10µF 16V
2706	4822 124 23002	10µF 16V
2709	4822 124 80151	47µF 16V
2710	2020 552 96656	10µF 20% 25V 1210
2711	2020 552 96656	10µF 20% 25V 1210
2713	2020 012 00028	470µF 20% 16V
2714	3198 035 02210	220pF 5% 50V 0402
2715	2020 552 96455	22nF 10% 16V 0402
2716	2020 012 00028	470µF 20% 16V
2730	2020 552 96656	10µF 20% 25V 1210
2731	2020 012 00003	470µF 16V 20% SMD
2733	3198 035 02210	220pF 5% 50V 0402
2734	2238 787 16641	22nF 10% 16V 0402
2735	3198 035 04710	470pF 50V 0402
2736	2022 031 00308	22µF 20% 35V
2737	2020 012 00003	470µF 16V 20% SMD
2738	4822 124 80151	47µF 16V
2739	4822 124 80151	47µF 16V
2741	4822 126 13879	220nF +80-20% 16V
2750	2020 552 00035	2.2µF 6.3V 10% 0603
2753	2020 012 00003	470µF 16V 20% SMD
2755	3198 035 14720	4.7nF 5% 25V 0402
2756	3198 035 04710	470pF 50V 0402
2757	2020 012 00003	470µF 16V 20% SMD
2758	2020 012 00003	470µF 16V 20% SMD
2761	2020 552 96671	1µF 10% 25V
2762	4822 124 23237	22µF 6.3V
2800	2020 021 91557	100µF 20% 16V
2801	3198 035 71040	100nF 10% 16V 0402
2802	3198 035 71040	100nF 10% 16V 0402
2803	3198 035 71040	100nF 10% 16V 0402
2804	3198 035 71040	100nF 10% 16V 0402
2805	3198 035 71040	100nF 10% 16V 0402
2806	3198 035 71040	100nF 10% 16V 0402
2807	3198 035 71040	100nF 10% 16V 0402
2808	3198 035 71040	100nF 10% 16V 0402
2809	3198 035 71040	100nF 10% 16V 0402
2810	3198 035 71040	100nF 10% 16V 0402
2811	3198 035 71040	100nF 10% 16V 0402
2812	3198 035 71040	100nF 10% 16V 0402
2813	3198 035 71040	100nF 10% 16V 0402
2814	3198 035 71040	100nF 10% 16V 0402
2815	5322 124 41945	22µF 20% 35V
2816	3198 035 71040	100nF 10% 16V 0402
2817	3198 035 71040	100nF 10% 16V 0402
2818	3198 035 71040	100nF 10% 16V 0402
2819	3198 035 71040	100nF 10% 16V 0402
2820	3198 035 71040	100nF 10% 16V 0402
2821	3198 035 71040	100nF 10% 16V 0402
2822	3198 035 71040	100nF 10% 16V 0402
2823	4822 126 14519	22pF 5% 50V 0402
2824	4822 126 14519	22pF 5% 50V 0402
2900	3198 035 71040	100nF 10% 16V 0402
2901	2020 552 96618	1nF 10% 50V 0402
2902	2020 021 00046	470µF 20% 16V
2903	3198 035 71040	100nF 10% 16V 0402
2904	4822 124 80151	47µF 16V
2905	2020 021 91557	100µF 20% 16V
2906	3198 035 71040	100nF 10% 16V 0402
2907	3198 035 71040	100nF 10% 16V 0402
2908	3198 035 71040	100nF 10% 16V 0402
2909	3198 035 71040	100nF 10% 16V 0402
2910	3198 035 71040	100nF 10% 16V 0402
2911	3198 035 71040	100nF 10% 16V 0402
2912	3198 035 71040	100nF 10% 16V 0402
2913	3198 035 71040	100nF 10% 16V 0402
2914	3198 035 71040	100nF 10% 16V 0402
2915	3198 035 71040	100nF 10% 16V 0402
2916	3198 035 71040	100nF 10% 16V 0402
2917	2020 021 91557	100µF 20% 16V
2918	3198 035 71040	100nF 10% 16V 0402
2919	3198 035 71040	100nF 10% 16V 0402
2920	3198 035 71040	100nF 10% 16V 0402
2921	3198 035 71040	100nF 10% 16V 0402
2922	3198 035 71040	100nF 10% 16V 0402
2923	3198 035 71040	100nF 10% 16V 0402
2924	3198 035 71040	100nF 10% 16V 0402
2925	3198 035 71040	100nF 10% 16V 0402
2926	3198 035 71040	100nF 10% 16V 0402
2927	3198 035 71040	100nF 10% 16V 0402
2928	3198 035 71040	100nF 10% 16V 0402
2929	3198 035 71040	100nF 10% 16V 0402
2930	3198 035 71040	100nF 10% 16V 0402
2931	3198 035 71040	100nF 10% 16V 0402
2932	3198 035 71040	100nF 10% 16V 0402
2933	3198 035 71040	100nF 10% 16V 0402
2934	4822 124 80151	47µF 16V
2935	3198 035 71040	100nF 10% 16V 0402
2936	3198 035 71040	100nF 10% 16V 0402
2937	3198 035 71040	100nF 10% 16V 0402
2938	3198 035 71040	100nF 10% 16V 0402
2939	3198 035 71040	100nF 10% 16V 0402
2940	4822 124 80151	47µF 16V
2941	3198 035 71040	100nF 10% 16V 0402
2942	3198 035 71040	100nF 10% 16V 0402
2945	5322 124 41945	22µF 20% 35V

2946	3198 035 71040	100nF 10% 16V 0402
2947	3198 035 71040	100nF 10% 16V 0402
2948	3198 035 71040	100nF 10% 16V 0402
2949	3198 035 71040	100nF 10% 16V 0402
2950	5322 124 41945	22µF 20% 35V
2951	3198 035 71040	100nF 10% 16V 0402
2952	3198 035 71040	100nF 10% 16V 0402
2953	3198 035 71040	100nF 10% 16V 0402
2954	3198 035 71040	100nF 10% 16V 0402
2955	5322 124 41945	22µF 20% 35V
2956	3198 035 71040	100nF 10% 16V 0402
2957	3198 035 71040	100nF 10% 16V 0402
2958	3198 035 71040	100nF 10% 16V 0402
2959	3198 035 71040	100nF 10% 16V 0402
2A00	2238 586 59812	100nF 20% 50V 0603
2A01	2238 869 15101	100pF 5% 50V 0402
2A02	2238 869 15101	100pF 5% 50V 0402
2A12	2020 552 96628	10nF 10% 16V 0402
2A13	3198 035 71040	100nF 10% 16V 0402
2B01	4822 124 80151	47µF 16V
2B02	4822 124 11131	47µF 6.3V
2B03	3198 035 71040	100nF 10% 16V 0402
2B04	3198 035 71040	100nF 10% 16V 0402
2B05	3198 035 71040	100nF 10% 16V 0402
2B06	3198 035 71040	100nF 10% 16V 0402
2B07	3198 035 71040	100nF 10% 16V 0402
2B08	3198 035 71040	100nF 10% 16V 0402
2B09	3198 035 71040	100nF 10% 16V 0402
2B10	3198 035 71040	100nF 10% 16V 0402
2B11	3198 035 71040	100nF 10% 16V 0402
2B12	3198 035 71040	100nF 10% 16V 0402
2B13	3198 035 71040	100nF 10% 16V 0402
2B14	3198 035 71040	100nF 10% 16V 0402
2B15	3198 035 71040	100nF 10% 16V 0402
2B16	3198 035 71040	100nF 10% 16V 0402
2B17	3198 035 71040	100nF 10% 16V 0402
2B18	5322 124 41945	22µF 20% 35V
2C00	3198 035 71040	100nF 10% 16V 0402
2C01	4822 124 23002	10µF 16V
2C02	3198 035 71040	100nF 10% 16V 0402
2C03	3198 035 71040	100nF 10% 16V 0402
2E00	2020 552 00005	4.7µF 10% 6.3V 0603
2E01	2020 552 00005	4.7µF 10% 6.3V 0603
2E02	2020 552 00005	4.7µF 10% 6.3V 0603
2E03	3198 035 71040	100nF 10% 16V 0402
2E04	2020 552 96834	1µF 20% 6.3V 0402
2E05	2020 552 96834	1µF 20% 6.3V 0402
2E06	2020 552 96834	1µF 20% 6.3V 0402
2E07	4822 126 14324	33pF 5% 50V 0402
2E08	2020 552 00005	4.7µF 10% 6.3V 0603
2E09	4822 126 14324	33pF 5% 50V 0402
2E10	2020 552 00005	4.7µF 10% 6.3V 0603
2E11	4822 126 14324	33pF 5% 50V 0402
2E12	2020 552 00005	4.7µF 10% 6.3V 0603
2E13	3198 017 41050	1µF 10V 0603
2E14	4822 126 14324	33pF 5% 50V 0402
2E15	3198 035 71040	100nF 10% 16V 0402
2E16	3198 035 71040	100nF 10% 16V 0402
2E17	3198 035 71040	100nF 10% 16V 0402
2E18	3198 035 71040	100nF 10% 16V 0402
2E19	3198 035 71040	100nF 10% 16V 0402
2E20	4822 124 11131	47µF 6.3V
2E21	2020 552 00005	4.7µF 10% 6.3V 0603
2E22	2020 552 00005	4.7µF 10% 6.3V 0603
2E23	2020 552 00005	4.7µF 10% 6.3V 0603
2E24	3198 035 71040	100nF 10% 16V 0402
2E25	3198 035 71040	100nF 10% 16V 0402
2E26	3198 035 71040	100nF 10% 16V 0402
2E27	3198 035 71040	100nF 10% 16V 0402
2E28	3198 035 71040	100nF 10% 16V 0402
2E29	3198 035 71040	100nF 10% 16V 0402
2E30	3198 035 71040	100nF 10% 16V 0402
2E31	3198 035 71040	100nF 10% 16V 0402
2E32	3198 035 71040	100nF 10% 16V 0402
2E33	2020 552 00005	4.7µF 10% 6.3V 0603
2E34	2020 552 00005	4.7µF 10% 6.3V 0603
2E35	2020 552 00005	4.7µF 10% 6.3V 0603
2E36	3198 035 71040	100nF 10% 16V 0402
2F04	2020 552 94427	100pF 5% 50V
2F07	2238 586 59812	100nF 20% 50V 0603
2F08	4822 126 14241	330pF 0603 50V
2F09	4822 126 14241	330pF 0603 50V
2F10	2020 552 94427	100pF 5% 50V
2F11	4822 126 14241	330pF 0603 50V
2F12	4822 126 14241	330pF 0603 50V
2F13	4822 126 14508	180pF 5% 50V 0603
2F14	4822 126 14508	180pF 5% 50V 0603
2F15	2020 552 00035	2.2µF 6.3V 10% 0603
2F16	2020 552 00035	2.2µF 6.3V 10% 0603
2G05	4822 126 14241	330pF 0603 50V
2G06	4822 126 14508	180pF 5% 50V 0603
2G07	4822 124 23002	10µF 16V
2G08	2020 552 00035	2.2µF 6.3V 10% 0603
2G09	4822 126 14241	330pF 0603 50V
2G10	4822 126 14508	180pF 5% 50V 0603
2G11	4822 124 23002	10µF 16V
2G12	2020 552 00035	2.2µF 6.3V 10% 0603
2G18	4822 126 14241	330pF 0603 50V
2G19	4822 126 14508	180pF 5% 50V 0603
2G20	4822 124 23002	10µF 16V
2G21	2020 552 00035	2.2µF 6.3V 10% 0603
2G22	4822 126 14241	330pF 0603 50V
2G23	4822 126 14508	180pF 5% 50V 0603
2G24	4822 124 23002	10µF 16V
2G25	2020 552 00035	2.2µF 6.3V 10% 0603
2G26	2020 552 00005	4.7µF 10% 6.3V 0603
2G28	2020 552 00005	4.7µF 10% 6.3V 0603
2G47	2238 586 59812	100nF 20% 50V 0603
2G55	2020 552 00005	4.7µF 10% 6.3V 0603
2G56	2020 552 00005	4.7µF 10% 6.3V 0603
2J02	2020 552 96618	1nF 10% 50V 0402
2J03	2020 552 96618	1nF 10% 50V 0402
2J17	2020 552 96618	1nF 10% 50V 0402
2J18	2238 869 15101	100pF 5% 50V 0402
2J19	2238 869 15101	100pF 5% 50V 0402
2J21	2238 869 15101	100pF 5% 50V 0402
2J22	2238 869 15101	100pF 5% 50V 0402
2J23	2238 869 15101	100pF 5% 50V 0402
2J26	2238 869 15101	100pF 5% 50V 0402
2J27	2238 869 15101	100pF 5% 50V 0402
2J28	2238 869 15101	100pF 5% 50V 0402
2J29	2238 869 15101	100pF 5% 50V 0402
2J30	2020 552 96618	1nF 10% 50V 0402
2J31	2238 869 15101	100pF 5% 50V 0402
2J35	2020 552 96618	1nF 10% 50V 0402
2K00	2020 552 96618	1nF 10% 50V 0402
2K01	2020 552 96618	1nF 10% 50V 0402
2K02	2238 869 15109	10pF 5% 50V 0402
2K03	2238 869 15109	10pF 5% 50V 0402
2K04	2238 869 15109	10pF 5% 50V 0402
2K05	2238 869 15109	10pF 5% 50V 0402
2K06	2238 869 15101	100pF 5% 50V 0402
2K07	2238 869 15101	100pF 5% 50V 0402
2K08	2020 552 00035	2.2µF 6.3V 10% 0603
2K10	2238 869 15101	100pF 5% 50V 0402
2K11	2238 869 15101	100pF 5% 50V 0402
2K12	2020 552 00035	2.2µF 6.3V 10% 0603
2K13	2238 869 15101	100pF 5% 50V 0402
2K14	2238 869 15101	100pF 5% 50V 0402
2K16	2238 869 15101	100pF 5% 50V 0402
2K17	2238 869 15101	100pF 5% 50V 0402
2K18	2238 869 15101	100pF 5% 50V 0402
2K19	2020 552 96618	1nF 10% 50V 0402
2K20	2020 552 96618	1nF 10% 50V 0402
2K21	2238 869 15101	100pF 5% 50V 0402
2K22	2238 869 15101	100pF 5% 50V 0402
2K23	2238 869 15101	100pF 5% 50V 0402
2K24	2238 869 15101	100pF 5% 50V 0402
2K25	2238 869 15101	100pF 5% 50V 0402
2K26	2238 869 15101	100pF 5% 50V 0402
2K27	2238 869 15101	100pF 5% 50V 0402
2K28	2238 869 15101	100pF 5% 50V 0402
2L02	2020 552 96637	10µF 10% 6.3V 0805
2L03	3198 035 71040	100nF 10% 16V 0402
2L04	3198 035 71040	100nF 10% 16V 0402
2L05	3198 035 71040	100nF 10% 16V 0402
2L06	3198 035 71040	100nF 10% 16V 0402
2L07	2020 552 96637	10µF 10% 6.3V 0805
2L08	3198 035 71040	100nF 10% 16V 0402
2L09	3198 035 71040	100nF 10% 16V 0402
2L10	3198 035 71040	100nF 10% 16V 0402
2L11	3198 035 71040	100nF 10% 16V 0402
2L13	3198 035 74730	47nF 5% 16V 0402
2L17	3198 035 74730	47nF 5% 16V 0402
2L20	3198 035 71040	100nF 10% 16V 0402
2L21	3198 035 71040	100nF 10% 16V 0402
2L22	2020 552 96637	10µF 10% 6.3V 0805
2L23	3198 035 71040	100nF 10% 16V 0402
2L24	3198 035 71040	100nF 10% 16V 0402
2L26	2020 552 96718	220nF 10% 6.3V 0402
2L27	4822 124 23002	10µF 16V
2L28	4822 124 23002	10µF 16V
2L29	4822 124 23002	10µF 16V
2L30	4822 124 23002	10µF 16V
2L31	4822 124 12095	100µF 20% 16V
2L32	4822 124 12095	100µF 20% 16V
2L33	3198 035 71040	100nF 10% 16V 0402
2L34	3198 035 71040	100nF 10% 16V 0402
2L37	4822 126 14524	68pF 5% 50V 0402
2L39	2238 869 15829	82pF 5% 50V 0402
2M00	3198 035 71040	100nF 10% 16V 0402
2M01	3198 035 71040	100nF 10% 16V 0402
2M02	3198 035 71040	100nF 10% 16V 0402
2M03	3198 035 71040	100nF 10% 16V 0402
2M04	3198 035 71040	100nF 10% 16V 0402
2M05	3198 035 71040	100nF 10% 16V 0402
2M06	3198 035 71040	100nF 10% 16V 0402
2M07	3198 035 71040	100nF 10% 16V 0402
2M08	3198 035 71040	100nF 10% 16V 0402
2M09	3198 035 71040	100nF 10% 16V 0402
2M10	3198 035 71040	100nF 10% 16V 0402
2M11	3198 035 71040	100nF 10% 16V 0402
2M12	3198 035 71040	100nF 10% 16V 0402
2M13	3198 035 71040	100nF 10% 16V 0402
2M14	3198 035 71040	100nF 10% 16V 0402
2M15	3198 035 71040	100nF 10% 16V 0402
2M16	3198 035 71040	100nF 10% 16V 0402
2M17	3198 035 71040	100nF 10% 16V 0402
2M18	3198 035 71040	100nF 10% 16V 0402
2M19	3198 035 71040	100nF 10% 16V 0402
2M20	3198 035 71040	100nF 10% 16V 0402
2M21	2020 552 00035	2.2µF 6.3V 10% 0603
2M22	3198 035 71040	100nF 10% 16V 0402
2M23	4822 124 12095	100µF 20% 16V
2M24	3198 035 71040	100nF 10% 16V 0402
2M25	3198 035 71040	100nF 10% 16V 0402
2M26	3198 035 71040	100nF 10% 16V 0402
2M27	3198 035 71040	100nF 10% 16V 0402
2M28	3198 035 71040	100nF 10% 16V 0402
2M29	3198 035 71040	100nF 10% 16V 0402
2M30	3198 035 71040	100nF 10% 16V 0402
2M31	4822 124 12095	100µF 20% 16V
2M32	4822 124 12095	100µF 20% 16V
2M56	4822 124 12095	100µF 20% 16V
2M65	3198 035 71040	100nF 10% 16V 0402
2M66	4822 124 12095	100µF 20% 16V
2M67	3198 035 71040	100nF 10% 16V 0402
2M68	4822 124 12095	100µF 20% 16V
2N01	3198 035 71040	100nF 10% 16V 0402
2N02	3198 035 71040	100nF 10% 16V 0402
2N03	2020 552 96834	1µF 20% 6.3V 0402
2N04	2020 552 96618	1nF 10% 50V 0402
2N05	3198 035 71040	100nF 10% 16V 0402
2N06	3198 035 71040	100nF 10% 16V 0402
2N07	3198 035 71040	100nF 10% 16V 0402
2N08	3198 035 71040	100nF 10% 16V 0402
2N09	3198 035 71040	100nF 10% 16V 0402
2N10	3198 035 71040	100nF 10% 16V 0402
2N11	2238 869 15101	100pF 5% 50V 0402
2N12	2238 869 15101	100pF 5% 50V 0402
2N13	2238 869 15101	100pF 5% 50V 0402
2N14	2238 869 15101	100pF 5% 50V 0402
2N15	2238 869 15101	100pF 5% 50V 0402
2N16	2238 869 15101	100pF 5% 50V 0402
2P01	2020 552 00035	2.2µF 6.3V 10% 0603
2P02	3198 035 71040	100nF 10% 16V 0402
2P03	3198 035 71040	100nF 10% 16V 0402
2P04	3198 035 71040	100nF 10% 16V 0402
2P05	3198 035 71040	100nF 10% 16V 0402
2P06	3198 035 71040	100nF 10% 16V 0402
2P07	3198 035 71040	100nF 10% 16V 0402
2P08	3198 035 71040	100nF 10% 16V 0402
2P09	3198 035 71040	100nF 10% 16V 0402
2P10	3198 035 71040	100nF 10% 16V 0402
2P11	3198 035 71040	100nF 10% 16V 0402
2P12	3198 035 71040	100nF 10% 16V 0402
2P13	3198 035 71040	100nF 10% 16V 0402
2P14	3198 035 71040	100nF 10% 16V 0402
2P15	4822 124 12095	100µF 20% 16V
2P16	3198 035 71040	100nF 10% 16V 0402
2P17	2020 552 00035	2.2µF 6.3V 10% 0603
2P18	2020 552 00035	2.2µF 6.3V 10% 0603
2P19	3198 035 71040	100nF 10% 16V 0402
2P20	3198 035 71040	100nF 10% 16V 0402
2P21	3198 035 71040	100nF 10% 16V 0402
2P22	2020 552 00035	2.2µF 6.3V 10% 0603
2P23	3198 035 71040	100nF 10% 16V 0402
2P24	3198 035 71040	100nF 10% 16V 0402
2P25	3198 035 71040	100nF 10% 16V 0402
2P26	3198 035 71040	100nF 10% 16V 0402
2P27	3198 035 71040	100nF 10% 16V 0402
2P28	3198 035 71040	100nF 10% 16V 0402
2P29	3198 035 71040	100nF 10% 16V 0402
2P30	3198 035 71040	100nF 10% 16V 0402
2P31	3198 035 71040	100nF 10% 16V 0402
2P32	3198 035 71040	100nF 10% 16V 0402
2P33	3198 035 71040	100nF 10% 16V 0402
2P34	3198 035 71040	100nF 10% 16V 0402
2P35	3198 035 71040	100nF 10% 16V 0402
2P36	2238 869 15109	10pF 5% 50V 0402
2P37	2238 869 15109	10pF 5% 50V 0402
2P38	2238 869 15109	10pF 5% 50V 0402
2P39	2238 869 15109	10pF 5% 50V 0402
2P40	2238 869 15109	10pF 5% 50V 0402
2P41	2238 869 15109	10pF 5% 50V 0402
2P42	2238 869 15109	10pF 5% 50V 0402
2P43	2238 869 15109	10pF 5% 50V 0402
2P44	2238 869 15109	10pF 5% 50V 0402
2P45	2238 869 15109	10pF 5% 50V 0402

-WW-		
3103	4822 117 13606	10kΩ 5% 0.01W 0402
3104	4822 051 30103	10kΩ 5% 0.062W
3105	4822 117 13548	1kΩ 5% 0402
3107	4822 051 30682	6.8Ω 5% 0.062W
3108	4822 051 30222	2.2kΩ 5% 0.062W
3109	4822 051 30222	2.2kΩ 5% 0.062W
3111	4822 051 30223	22kΩ 5% 0.062W
3112	4822 051 30183	18kΩ 5% 0.062W
3120	4822 117 13606	10kΩ 5% 0.01W 0402
3121	4822 117 13606	10kΩ 5% 0.01W 0402
3122	4822 117 13545	100Ω 1% 0402
3123	4822 117 13545	100Ω 1% 0402
3124	4822 117 13545	100Ω 1% 0402
3125	4822 117 13545	100Ω 1% 0402
3207	3198 031 06810	680Ω 5% 0.01W 0402
3208	4822 117 13545	100Ω 1% 0402
3209	4822 117 13545	100Ω 1% 0402
3210	4822 117 13545	100Ω 1% 0402
3211	4822 117 13545	100Ω 1% 0402
3212	4822 117 13545	100Ω 1% 0402
3213	4822 117 13545	100Ω 1% 0402
3214	3198 031 06810	680Ω 5% 0.01W 0402
3215	3198 031 02710	270Ω 5% 0.1W 0402
3216	4822 117 13597	330Ω 5% 0402 0.01W
3217	4822 117 13548	1kΩ 5% 0402
3218	4822 117 11297	100kΩ 5% 0.1W
3219	4822 117 13545	100Ω 1% 0402
3220	3198 031 04730	47Ω 5% 0402
3222	4822 117 13545	100Ω 1% 0402
3223	3198 031 01090	10Ω 5% 0.01W 0402
3224	3198 031 04720	4.7kΩ 5% 0402
3225	3198 031 04720	4.7kΩ 5% 0402
3226	4822 117 13545	100Ω 1% 0402
3227	4822 117 13545	100Ω 1% 0402
3229	3198 031 04720	4.7kΩ 5% 0402
3230	4822 117 13606	10kΩ 5% 0.01W 0402
3231	4822 117 13602	2.2kΩ 5% 0.01W 0402
3232	3198 031 03320	3.3kΩ 5% 0402
3233	3198 031 03320	3.3kΩ 5% 0402
3234	3198 031 04720	4.7kΩ 5% 0402
3235	3198 031 04720	4.7kΩ 5% 0402
3236	3198 031 04720	4.7kΩ 5% 0402
3238	4822 117 13545	100Ω 1% 0402
3239	4822 117 13545	100Ω 1% 0402
3240	2322 704 61002	1kΩ 1%
3241	4822 117 13545	100Ω 1% 0402
3242	4822 117 13606	10kΩ 5% 0.01W 0402
3243	3198 031 04720	4.7kΩ 5% 0402
3245	3198 031 02240	220kΩ 5% 0.1W 0402
3246	3198 031 04720	4.7kΩ 5% 0402
3247	4822 117 13545	100Ω 1% 0402
3248	4822 117 13545	100Ω 1% 0402
3249	3198 031 04720	4.7kΩ 5% 0402
3250	4822 117 13545	100Ω 1% 0402
3251	4822 117 13545	100Ω 1% 0402
3252	4822 117 13545	100Ω 1% 0402
3253	4822 117 13545	100Ω 1% 0402
3255	4822 117 13605	Jumper 0402
3256	4822 117 13605	Jumper 0402
3257	4822 117 13605	Jumper 0402
3258	4822 117 13548	1kΩ 5% 0402
3259	4822 117 13548	1kΩ 5% 0402
3260	4822 117 13548	1kΩ 5% 0402
3262	4822 117 13601	22kΩ 5% 0402
3263	2322 702 70398	3.9Ω 5% 0603
3264	4822 117 13601	22kΩ 5% 0402
3265	2322 702 70398	3.9Ω 5% 0603
3266	3198 031 05620	5.6kΩ 5% 0.01W 0402
3267	3198 031 05620	5.6kΩ 5% 0.01W 0402
3268	4822 117 13545	100Ω 1% 0402
3272	3198 031 04720	4.7kΩ 5% 0402
3273	4822 117 13548	1kΩ 5% 0402
3274	3198 031 03910	390Ω 1% 0402
3275	4822 117 13545	100Ω 1% 0402
3276	3198 031 07590	75Ω 5% 0402
3277	3198 031 01520	1.2kΩ 5% 0.01W 0402
3280▲	4822 117 11151	1Ω 5%
3281	3198 031 03930	39kΩ 5% 0402
3285	4822 117 13605	Jumper 0402
3286	4822 117 13545	100Ω 1% 0402
3292▲	3198 031 01230	12kΩ 5% 0402
3294▲	3198 031 04730	47Ω 5% 0402
3295▲	4822 117 11297	100kΩ 5% 0.1W
3431	4822 117 13548	1kΩ 5% 0402
3451	3198 031 04720	4.7kΩ 5% 0402
3453	4822 117 13545	100Ω 1% 0402
3454	4822 117 13545	100Ω 1% 0402
3455	4822 117 13545	100Ω 1% 0402
3456	4822 117 13545	100Ω 1% 0402
3458	4822 117 13545	100Ω 1% 0402
3459	4822 117 13545	100Ω 1% 0402
3461	4822 117 13545	100Ω 1% 0402
3462	4822 117 13545	100Ω 1% 0402
3501	4822 117 13543	470Ω 5% 0402
3502	3198 031 04730	47Ω 5% 0402
3604	4822 117 13601	22kΩ 5% 0402
3605	4822 117 13601	22kΩ 5% 0402
3609	4822 117 13601	22kΩ 5% 0402
3610	4822 117 11297	100kΩ 5% 0.1W
3611	4822 117 11297	100kΩ 5% 0.1W
3612	4822 117 13601	22kΩ 5% 0402
3616	4822 117 13548	1kΩ 5% 0402
3617	4822 117 13548	1kΩ 5% 0402
3619	4822 117 13606	10kΩ 5% 0.01W 0402
3620	4822 117 13606	10kΩ 5% 0.01W 0402
3628	4822 117 13606	10kΩ 5% 0.01W 0402
3629	4822 117 13601	22kΩ 5% 0402
3630	4822 117 13602	2.2kΩ 5% 0.01W 0402
3631	4822 117 13602	2.2kΩ 5% 0.01W 0402
3632	2322 705 70569	56Ω 5% 0402
3633	2322 705 70569	56Ω 5% 0402
3708	4822 117 13606	10kΩ 5% 0.01W 0402
3709	3198 031 06820	6.8kΩ 5% 0.01W 0402
3712	5322 117 13031	5.6kΩ 1% 0.063W 0603
3713	2322 704 63302	3.3kΩ 1% 0603
3716	3198 031 04720	4.7kΩ 5% 0402
3732	2322 704 61002	1kΩ 1%
3733	2322 704 63302	3.3kΩ 1% 0603
3734	4822 117 13602	2.2kΩ 5% 0.01W 0402
3735	4822 117 13548	1kΩ 5% 0402
3736	3198 031 04720	4.7kΩ 5% 0402
3740	3198 031 01520	1.2kΩ 5% 0.01W 0402
3741	3198 031 01520	1.2kΩ 5% 0.01W 0402
3742	3198 031 01530	15kΩ 5% 0.01W 0402
3743	4822 117 13601	22kΩ 5% 0402
3750	4822 117 13601	22kΩ 5% 0402
3751	3198 021 31080	1Ω 5% 0603
3752	3198 021 31080	1Ω 5% 0603
3753	2322 704 61002	1kΩ 1%
3754	2322 704 63302	3.3kΩ 1% 0603
3759	3198 031 01230	12kΩ 5% 0402
3761	4822 117 13545	100Ω 1% 0402
3800	4822 117 13606	10kΩ 5% 0.01W 0402
3801	2350 035 10229	4 x 22Ω 5% 1206
3802	2350 035 10229	4 x 22Ω 5% 1206
3803	2350 035 10229	4 x 22Ω 5% 1206
3804	2350 035 10229	4 x 22Ω 5% 1206
3805	2350 035 10229	4 x 22Ω 5% 1206
3806	2350 035 10229	4 x 22Ω 5% 1206
3807	2350 035 10229	4 x 22Ω 5% 1206
3808	2350 035 10229	4 x 22Ω 5% 1206
3809	2350 035 10229	4 x 22Ω 5% 1206
3810	2350 035 10229	4 x 22Ω 5% 1206
3811	2350 035 10229	4 x 22Ω 5% 1206
3812	2350 035 10229	4 x 22Ω 5% 1206
3813	2350 035 10229	4 x 22Ω 5% 1206
3814	3198 031 02290	22Ω 5% 0.1W 0402
3815	3198 031 02290	22Ω 5% 0.1W 0402
3816	3198 031 02290	22Ω 5% 0.1W 0402
3817	4822 117 13606	10kΩ 5% 0.01W 0402
3818	4822 117 13606	10kΩ 5% 0.01W 0402
3820	4822 117 13606	10kΩ 5% 0.01W 0402
3822	4822 117 13545	100Ω 1% 0402
3824	3198 031 03320	3.3kΩ 5% 0402
3825	3198 031 11030	4 x 10kΩ 5% 1206
3826	3198 031 11030	4 x 10kΩ 5% 1206
3827	4822 117 13606	10kΩ 5% 0.01W 0402
3828	4822 117 13606	10kΩ 5% 0.01W 0402
3829	4822 117 13606	10kΩ 5% 0.01W 0402
3831	4822 117 13545	100Ω 1% 0402
3832	4822 117 13545	100Ω 1% 0402
3833	3198 031 01090	10Ω 5% 0.01W 0402
3834	4822 117 13606	10kΩ 5% 0.01W 0402
3835	4822 117 13606	10kΩ 5% 0.01W 0402
3836	4822 117 13606	10kΩ 5% 0.01W 0402
3837	4822 117 13606	10kΩ 5% 0.01W 0402
3838	4822 117 13606	10kΩ 5% 0.01W 0402
3839	4822 117 13545	100Ω 1% 0402
3840	3198 031 02290	22Ω 5% 0.1W 0402
3841	4822 117 13606	10kΩ 5% 0.01W 0402
3900	3198 031 03320	3.3kΩ 5% 0402
3901	4822 117 13606	10kΩ 5% 0.01W 0402
3902	4822 117 13606	10kΩ 5% 0.01W 0402
3903	4822 117 13545	100Ω 1% 0402
3904	4822 117 13545	100Ω 1% 0402
3A00	3198 031 06890	68Ω 5% 0402
3A01	3198 031 06890	68Ω 5% 0402
3A07	4822 117 13606	10kΩ 5% 0.01W 0402
3A08	4822 117 13606	10kΩ 5% 0.01W 0402
3A10	4822 117 13606	10kΩ 5% 0.01W 0402
3A11	4822 117 13606	10kΩ 5% 0.01W 0402
3A13	4822 117 13606	10kΩ 5% 0.01W 0402
3A14	3198 031 04720	4.7kΩ 5% 0402
3B01	4822 117 12706	10kΩ 1% 0.063W 0603
3B02	4822 117 12706	10kΩ 1% 0.063W 0603
3B03	2322 704 61501	150Ω 1% 0603
3C00	4822 117 13606	10kΩ 5% 0.01W 0402
3C01	4822 117 13606	10kΩ 5% 0.01W 0402
3C02	4822 117 13548	1kΩ 5% 0402
3C04	3198 031 11030	4 x 10kΩ 5% 1206
3C05	4822 117 13606	10kΩ 5% 0.01W 0402
3C06	3198 031 11030	4 x 10kΩ 5% 1206
3C07	3198 031 11030	4 x 10kΩ 5% 1206
3C08	3198 031 11030	4 x 10kΩ 5% 1206
3C09	3198 031 11030	4 x 10kΩ 5% 1206
3C10	3198 031 11030	4 x 10kΩ 5% 1206
3C16	3198 031 11030	4 x 10kΩ 5% 1206
3C17	4822 117 13606	10kΩ 5% 0.01W 0402
3C18	4822 117 13606	10kΩ 5% 0.01W 0402
3E00	2322 705 70569	56Ω 5% 0402
3E01	2322 705 70569	56Ω 5% 0402
3E02	2322 705 70569	56Ω 5% 0402
3E06	3198 031 04730	47Ω 5% 0402
3E07	3198 031 04730	47Ω 5% 0402
3E08	3198 031 04730	47Ω 5% 0402
3E09	3198 031 04730	47Ω 5% 0402
3E10	3198 031 04730	47Ω 5% 0402
3E11	3198 031 04730	47Ω 5% 0402
3E12	4822 117 13606	10kΩ 5% 0.01W 0402
3E13	4822 117 13597	330Ω 5% 0402 0.01W
3E14	4822 117 13597	330Ω 5% 0402 0.01W
3E15	4822 117 13597	330Ω 5% 0402 0.01W
3E16	4822 117 13597	330Ω 5% 0402 0.01W
3E17	4822 117 13597	330Ω 5% 0402 0.01W
3E18	4822 117 13597	330Ω 5% 0402 0.01W
3E19	2322 705 70569	56Ω 5% 0402
3E20	2322 705 70569	56Ω 5% 0402
3E21	2322 705 70569	56Ω 5% 0402
3E22	4822 117 13632	100kΩ 1% 0603 0.62W
3E23	3198 031 08210	820Ω 5% 0.5W
3E24	4822 117 13543	470Ω 5% 0402
3E25	2322 705 70399	39Ω 5% 0402
3E26	3198 031 02290	22Ω 5% 0.1W 0402
3E27	2322 705 70399	39Ω 5% 0402
3E28	3198 031 02290	22Ω 5% 0.1W 0402
3E29	2322 705 70399	39Ω 5% 0402
3E30	3198 031 02290	22Ω 5% 0.1W 0402
3E31	4822 117 13545	100Ω 1% 0402
3E32	4822 117 13545	100Ω 1% 0402
3E33	4822 117 13545	100Ω 1% 0402
3E34	4822 117 13545	100Ω 1% 0402
3E35	4822 117 13545	100Ω 1% 0402
3E36	4822 117 13545	100Ω 1% 0402
3E37	3198 031 02290	22Ω 5% 0.1W 0402
3E38	4822 117 13545	100Ω 1% 0402
3E39	4822 117 13545	100Ω 1% 0402
3E41	4822 117 13545	100Ω 1% 0402
3E42	4822 117 13545	100Ω 1% 0402
3E43	4822 117 13545	100Ω 1% 0402
3E44	4822 117 13545	100Ω 1% 0402
3E45	4822 117 13545	100Ω 1% 0402
3E49	3198 031 02290	22Ω 5% 0.1W 0402
3E50	3198 031 04730	47Ω 5% 0402
3E51	3198 031 04730	47Ω 5% 0402
3E52	3198 031 04730	47Ω 5% 0402
3E53	3198 031 04730	47Ω 5% 0402
3E54	3198 031 04730	47Ω 5% 0402
3E55	3198 031 04730	47Ω 5% 0402
3F00	4822 051 30759	75Ω 5% 0.062W
3F09	4822 051 30759	75Ω 5% 0.062W
3F10	3198 021 31080	1Ω 5% 0603
3F11	4822 051 30759	75Ω 5% 0.062W
3F16	4822 051 30103	10kΩ 5% 0.062W
3F17	4822 051 30103	10kΩ 5% 0.062W
3F18	4822 051 30103	10kΩ 5% 0.062W
3F19	3198 021 31080	1Ω 5% 0603
3F20	4822 051 30101	100Ω 5% 0.062W
3F21	4822 051 30102	1kΩ 5% 0.062W
3F22	4822 051 30103	10kΩ 5% 0.062W
3F23	4822 051 30102	1kΩ 5% 0.062W
3F24	4822 051 30103	10kΩ 5% 0.062W
3F25	4822 051 30103	10kΩ 5% 0.062W
3F26	4822 051 30153	15kΩ 5% 0.062W
3F27	4822 051 30153	15kΩ 5% 0.062W
3F28	4822 051 30101	100Ω 5% 0.062W
3F29	4822 051 30101	100Ω 5% 0.062W
3G00	4822 051 30151	150Ω 5% 0.062W
3G01	4822 051 30103	10kΩ 5% 0.062W
3G02	4822 117 12891	220kΩ 1%
3G03	4822 051 30153	15kΩ 5% 0.062W
3G04	4822 051 30151	150Ω 5% 0.062W
3G05	4822 051 30103	10kΩ 5% 0.062W
3G06	4822 117 12891	220kΩ 1%
3G07	4822 051 30153	15kΩ 5% 0.062W
3G08	4822 051 30151	150Ω 5% 0.062W
3G12	2122 118 06408	91Ω 5% 0603
3G13	2122 118 06408	91Ω 5% 0603
3G14	2122 118 06408	91Ω 5% 0603

3G15	4822 051 30101	100Ω 5% 0.062W
3G16	4822 051 30101	100Ω 5% 0.062W
3G17	4822 051 30101	100Ω 5% 0.062W
3G26	4822 051 30273	27kΩ 5% 0.062W
3G27	4822 051 30682	6.8Ω 5% 0.062W
3G28	4822 051 30759	75Ω 5% 0.062W
3G29	4822 051 30331	330Ω 5% 0.062W
3G30	4822 051 30689	68Ω 5% 0.063W 0603
3G31	4822 051 30759	75Ω 5% 0.062W
3G32	4822 051 30102	1kΩ 5% 0.062W
3G33	4822 051 30101	100Ω 5% 0.062W
3G34	4822 051 30102	1kΩ 5% 0.062W
3G37	4822 051 30151	150Ω 5% 0.062W
3G38	4822 051 30103	10kΩ 5% 0.062W
3G39	4822 117 12891	220kΩ 1%
3G40	4822 051 30153	15kΩ 5% 0.062W
3G41	4822 051 30151	150Ω 5% 0.062W
3G42	4822 051 30103	10kΩ 5% 0.062W
3G43	4822 117 12891	220kΩ 1%
3G44	4822 051 30153	15kΩ 5% 0.062W
3G45	4822 051 30759	75Ω 5% 0.062W
3G46	4822 051 30101	100Ω 5% 0.062W
3G47	4822 117 12925	47kΩ 1% 0.063W 0603
3G48	4822 117 12925	47kΩ 1% 0.063W 0603
3G51	4822 051 30273	27kΩ 5% 0.062W
3G52	4822 051 30682	6.8Ω 5% 0.062W
3G53	4822 051 30689	68Ω 5% 0.063W 0603
3G54	4822 051 30102	1kΩ 5% 0.062W
3G57	4822 051 30759	75Ω 5% 0.062W
3G58	4822 051 30101	100Ω 5% 0.062W
3G59	4822 117 12925	47kΩ 1% 0.063W 0603
3G60	4822 117 12925	47kΩ 1% 0.063W 0603
3G96	4822 117 12925	47kΩ 1% 0.063W 0603
3G99	4822 117 12925	47kΩ 1% 0.063W 0603
3J05	3198 031 06890	68Ω 5% 0402
3K00	4822 117 13545	100Ω 1% 0402
3K01	4822 117 13545	100Ω 1% 0402
3K02	4822 117 13606	10kΩ 5% 0.01W 0402
3K03	3198 031 01530	15kΩ 5% 0.01W 0402
3K05	4822 117 13606	10kΩ 5% 0.01W 0402
3K06	3198 031 01530	15kΩ 5% 0.01W 0402
3K07	2322 705 70399	39Ω 5% 0402
3K09	2322 705 70399	39Ω 5% 0402
3K11	3198 031 06890	68Ω 5% 0402
3K12	3198 031 06890	68Ω 5% 0402
3K13	3198 031 06890	68Ω 5% 0402
3L00	4822 117 13548	1kΩ 5% 0402
3L04	4822 117 13605	Jumper 0402
3L05	3198 031 01510	150Ω 5% 0.01W 0402
3L06	4822 117 13605	Jumper 0402
3L10	4822 117 13597	330Ω 5% 0402 0.01W
3L11	3198 031 01510	150Ω 5% 0.01W 0402
3L12	4822 117 13548	1kΩ 5% 0402
3L16	4822 117 13605	Jumper 0402
3L17	3198 031 01510	150Ω 5% 0.01W 0402
3L19	3198 031 01510	150Ω 5% 0.01W 0402
3L20	3198 031 01510	150Ω 5% 0.01W 0402
3L21	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L22	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L24	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L25	2350 035 10229	4 x 22Ω 5% 1206
3L26	2350 035 10229	4 x 22Ω 5% 1206
3L27	2350 035 10229	4 x 22Ω 5% 1206
3L28	2350 035 10229	4 x 22Ω 5% 1206
3L30	3198 031 02290	22Ω 5% 0.1W 0402
3L31	3198 031 02290	22Ω 5% 0.1W 0402
3L32	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L33	4822 117 13596	220Ω 5% 0.01W 0402
3L34	4822 117 13605	Jumper 0402
3L35	4822 117 13596	220Ω 5% 0.01W 0402
3L36	3198 031 03320	3.3kΩ 5% 0402
3L37	3198 031 03320	3.3kΩ 5% 0402
3M01	2350 035 10689	4 x 68Ω 5%
3M02	2350 035 10689	4 x 68Ω 5%
3M03	2350 035 10689	4 x 68Ω 5%
3M04	2350 035 10689	4 x 68Ω 5%
3M06	2350 035 10229	4 x 22Ω 5% 1206
3M07	2350 035 10229	4 x 22Ω 5% 1206
3M08	2350 035 10229	4 x 22Ω 5% 1206
3M09	2350 035 10229	4 x 22Ω 5% 1206
3M11	3198 031 04720	4.7kΩ 5% 0402
3M13	3198 031 04720	4.7kΩ 5% 0402
3M14	4822 117 13545	100Ω 1% 0402
3M15	4822 117 13545	100Ω 1% 0402
3M16	3198 031 04720	4.7kΩ 5% 0402
3M26	4822 117 13605	Jumper 0402
3M27	4822 117 13605	Jumper 0402
3M50	4822 117 13606	10kΩ 5% 0.01W 0402
3M51	4822 117 13606	10kΩ 5% 0.01W 0402
3M52	4822 117 13606	10kΩ 5% 0.01W 0402
3M53	4822 117 13546	47Ω 5% 0402
3M54	4822 117 13546	47Ω 5% 0402
3M55	4822 117 13546	47Ω 5% 0402
3M56	4822 117 13606	10kΩ 5% 0.01W 0402
3M57	4822 117 13546	47Ω 5% 0402
3M58	4822 117 13606	10kΩ 5% 0.01W 0402
3M59	4822 117 13546	47Ω 5% 0402
3M78	4822 117 13548	1kΩ 5% 0402
3M79	3198 031 03320	3.3kΩ 5% 0402
3M87	4822 117 13605	Jumper 0402
3M89	3198 031 02290	22Ω 5% 0.1W 0402
3M90	3198 031 02290	22Ω 5% 0.1W 0402
3N01	4822 117 13606	10kΩ 5% 0.01W 0402
3N02	4822 117 13606	10kΩ 5% 0.01W 0402
3N03	4822 117 13606	10kΩ 5% 0.01W 0402
3N04	4822 117 13606	10kΩ 5% 0.01W 0402
3N05	4822 117 13606	10kΩ 5% 0.01W 0402
3N06	4822 117 13606	10kΩ 5% 0.01W 0402
3N07	4822 051 30333	33kΩ 5% 0.062W
3N08	4822 117 13606	10kΩ 5% 0.01W 0402
3N09	4822 117 13548	1kΩ 5% 0402
3N10	4822 117 13603	33kΩ 5% 0402
3N11	4822 117 13546	47Ω 5% 0402
3N12	4822 117 13606	10kΩ 5% 0.01W 0402
3N13	4822 117 13606	10kΩ 5% 0.01W 0402
3N14	4822 117 13606	10kΩ 5% 0.01W 0402
3N15	4822 117 13546	47Ω 5% 0402
3N16	4822 117 13546	47Ω 5% 0402
3N17	4822 117 13546	47Ω 5% 0402
3N18	4822 117 13546	47Ω 5% 0402
3N19	4822 117 13606	10kΩ 5% 0.01W 0402
3N20	4822 117 13546	47Ω 5% 0402
3N21	4822 117 13545	100Ω 1% 0402
3N22	4822 117 13545	100Ω 1% 0402
3N23	4822 117 13545	100Ω 1% 0402
3N24	4822 117 13545	100Ω 1% 0402
3N25	4822 117 13545	100Ω 1% 0402
3N26	3198 031 04720	4.7kΩ 5% 0402
3N27	4822 117 13546	47Ω 5% 0402
3N28	4822 051 30181	180Ω 5% 0.062W
3N29	4822 117 13545	100Ω 1% 0402
3N30	4822 117 13545	100Ω 1% 0402
3N31	4822 117 13545	100Ω 1% 0402
3N32	4822 117 13545	100Ω 1% 0402
3N33	4822 117 13545	100Ω 1% 0402
3N34	4822 117 13545	100Ω 1% 0402
3N35	4822 117 13545	100Ω 1% 0402
3N46	4822 117 13545	100Ω 1% 0402
3N47	4822 117 13545	100Ω 1% 0402
3P01	3198 031 04720	4.7kΩ 5% 0402
3P03	4822 117 13546	47Ω 5% 0402
3P04	4822 117 13545	100Ω 1% 0402
3P04	4822 117 13605	Jumper 0402
3P05	4822 117 13545	100Ω 1% 0402
3P05	4822 117 13605	Jumper 0402
3S00	4822 117 12925	47kΩ 1% 0.063W 0603
3S03	4822 117 12925	47kΩ 1% 0.063W 0603
4211	4822 117 13605	Jumper 0402
4212	4822 117 13605	Jumper 0402
4440	4822 117 13605	Jumper 0402
4441	4822 117 13605	Jumper 0402
4501	4822 117 13605	Jumper 0402
4502	4822 117 13605	Jumper 0402
4504	4822 117 13605	Jumper 0402
4511	4822 117 13605	Jumper 0402
4801	4822 117 13605	Jumper 0402
4A04	4822 117 13605	Jumper 0402
4J01	4822 117 13605	Jumper 0402
4K04	4822 117 13605	Jumper 0402
4K05	4822 117 13605	Jumper 0402
4L02	4822 117 13605	Jumper 0402
4M00	4822 117 13605	Jumper 0402
4M01	4822 117 13605	Jumper 0402
4M02	4822 117 13605	Jumper 0402
4M03	4822 117 13605	Jumper 0402
4M05	4822 117 13605	Jumper 0402
4M08	4822 117 13605	Jumper 0402
4M09	4822 117 13605	Jumper 0402
4M10	4822 117 13605	Jumper 0402
4M16	4822 117 13605	Jumper 0402
4M17	4822 117 13605	Jumper 0402
4N01	4822 117 13605	Jumper 0402
4N02	4822 117 13605	Jumper 0402
4N03	4822 117 13605	Jumper 0402
4N04	4822 117 13605	Jumper 0402
4N05	4822 117 13605	Jumper 0402
4N06	4822 117 13605	Jumper 0402
4N07	4822 117 13605	Jumper 0402
4N08	4822 117 13605	Jumper 0402
4N09	4822 117 13605	Jumper 0402
4N10	4822 117 13605	Jumper 0402
4N11	4822 117 13605	Jumper 0402
4N12	4822 117 13605	Jumper 0402
4N13	4822 117 13605	Jumper 0402
4N14	4822 117 13605	Jumper 0402
4N15	4822 117 13605	Jumper 0402
4N16	4822 117 13605	Jumper 0402
4N17	4822 117 13605	Jumper 0402
4N18	4822 117 13605	Jumper 0402
4N19	4822 117 13605	Jumper 0402
4N20	4822 117 13605	Jumper 0402
4N21	4822 117 13605	Jumper 0402
4N22	4822 117 13605	Jumper 0402
4P07	4822 117 13605	Jumper 0402

5101	3198 018 33970	0.39µF 10% 0805
5103	4822 157 71334	0.68µH 5% 1008
5107	4822 051 30101	100Ω 5% 0.062W
5108	4822 051 30101	100Ω 5% 0.062W
5201	4822 157 11716	Bead 30Ω at 100MHz
5202	4822 157 11716	Bead 30Ω at 100MHz
5203	4822 157 11716	Bead 30Ω at 100MHz
5204	2422 549 42896	Bead 120Ω 100MHz
5205	4822 157 11716	Bead 30Ω at 100MHz
5206	4822 157 11716	Bead 30Ω at 100MHz
5207	2422 549 42896	Bead 120Ω 100MHz
5208	4822 157 11716	Bead 30Ω at 100MHz
5209	4822 157 11716	Bead 30Ω at 100MHz
5210	4822 157 11716	Bead 30Ω at 100MHz
5211	4822 157 11716	Bead 30Ω at 100MHz
5212	4822 157 11716	Bead 30Ω at 100MHz
5213	4822 157 11716	Bead 30Ω at 100MHz
5214	2422 536 00667	1000µF 20% 7032
5216	4822 157 11716	Bead 30Ω at 100MHz
5218▲	2422 549 45333	Bead 120Ω 100MHz
5501	3198 018 31080	1µF 10% 0805
5704	4822 157 63635	10µF 20% 1206
5709	2422 535 94134	10µH 20% 0805
5712	2422 536 00339	33µ 20%
5713	2422 535 94995	10µF 20% 10145
5730	2422 535 94134	10µH 20% 0805
5733	2422 536 00689	220µF 20%
5735	2422 536 00667	1000µF 20% 7032
5737	2422 535 94134	10µH 20% 0805
5738	2422 549 45333	Bead 120Ω 100MHz
5752	2422 535 94134	10µH 20% 0805
5753	2422 536 00689	220µF 20%
5754	2422 535 94134	10µH 20% 0805
5900	2422 549 45333	Bead 120Ω 100MHz
5901	2422 549 45333	Bead 120Ω 100MHz
5902	2422 549 45333	Bead 120Ω 100MHz
5903	2422 549 45333	Bead 120Ω 100MHz
5904	2422 549 45333	Bead 120Ω 100MHz
5905	2422 549 45333	Bead 120Ω 100MHz
5906	2422 549 45333	Bead 120Ω 100MHz
5907	2422 549 45333	Bead 120Ω 100MHz
5908	2422 549 45333	Bead 120Ω 100MHz
5909	2422 549 45333	Bead 120Ω 100MHz
5910	2422 549 45333	Bead 120Ω 100MHz
5911	2422 549 45333	Bead 120Ω 100MHz
5A00	4822 157 11716	Bead 30Ω at 100MHz
5C00	2422 549 45333	Bead 120Ω 100MHz
5E00	2422 549 45333	Bead 120Ω 100MHz
5E01	2422 549 45333	Bead 120Ω 100MHz
5E02	2422 549 45333	Bead 120Ω 100MHz
5E03	2422 549 45333	Bead 120Ω 100MHz
5F00	2422 549 45333	Bead 120Ω 100MHz
5F01	2422 549 45333	Bead 120Ω 100MHz
5F02	2422 549 45333	Bead 120Ω 100MHz
5F03	2422 549 45333	Bead 120Ω 100MHz
5G02	2422 549 45333	Bead 120Ω 100MHz
5J01	2422 549 42896	Bead 120Ω 100MHz
5J02	2422 549 42896	Bead 120Ω 100MHz
5J03	2422 549 45333	Bead 120Ω 100MHz
5J04	2422 549 45333	Bead 120Ω 100MHz
5L00	2422 549 45333	Bead 120Ω 100MHz
5L01	2422 549 45333	Bead 120Ω 100MHz
5L02	2422 549 45333	Bead 120Ω 100MHz
5M00	2422 549 45333	Bead 120Ω 100MHz
5M01	2422 549 45333	Bead 120Ω 100MHz
5M02	2422 549 45333	Bead 120Ω 100MHz
5M03	2422 549 45333	Bead 120Ω 100MHz
5M04	2422 549 45333	Bead 120Ω 100MHz
5M05	2422 549 45333	Bead 120Ω 100MHz
5N01	4822 157 11716	Bead 30Ω at 100MHz
5N02	4822 157 11716	Bead 30Ω at 100MHz
5N03	4822 157 11716	Bead 30Ω at 100MHz
5N04	4822 157 11716	Bead 30Ω at 100MHz
5N05	4822 157 11716	Bead 30Ω at 100MHz
5P01	4822 157 11716	Bead 30Ω at 100MHz
5P02	4822 157 11716	Bead 30Ω at 100MHz
5P03	4822 157 11716	Bead 30Ω at 100MHz
5P04	4822 157 11716	Bead 30Ω at 100MHz
5P05	4822 157 11716	Bead 30Ω at 100MHz
5P06	4822 157 11716	Bead 30Ω at 100MHz

6101	4822 130 11416	PDZ6.8B
6102	4822 130 11416	PDZ6.8B
6103	4822 130 11397	BAS316
6104	4822 130 11525	1SS356
6204	4822 130 80622	BAT54
6205	4822 130 80622	BAT54
6430	9340 548 42115	PDZ2.4B
6431	9965 000 20150	1N4148WS SOD-323
6601	4822 130 10838	UDZ3.3B
6708	3198 010 10720	SS24
6709	9322 128 70685	SMSS14
6712	3198 010 10730	SS36
6733	9322 128 70685	SMSS14
6735	5322 130 34337	BAV99
6736	9340 548 71115	PDZ33B
6740	4822 130 10837	UDZS8.2B
6751	9322 128 70685	SMSS14
6E01	9322 102 64685	UDZ2.7B
6E03	9322 102 64685	UDZ2.7B
6F00	4822 130 11397	BAS316
6F01	4822 130 11397	BAS316
6G03	4822 130 11416	PDZ6.8B
6G04	4822 130 11416	PDZ6.8B
6G05	4822 130 11416	PDZ6.8B
6G06	4822 130 11416	PDZ6.8B
6G07	4822 130 11416	PDZ6.8B
6G08	4822 130 11416	PDZ6.8B
6G09	4822 130 11416	PDZ6.8B
6G10	4822 130 11416	PDZ6.8B
6N01	9322 085 77685	TLMG3100

7101	3198 010 42310	BC847BW
7201	9340 550 49115	PUMH7
7202	9340 550 49115	PUMH7
7206	4822 130 60373	BC856B
7207	9322 214 45668	M24C16-WMN6P
7208	3198 010 42310	BC847BW
7209	3198 010 42310	BC847BW
7210	3198 010 42310	BC847BW
7214	9339 693 90135	BCP69-25
7215	9339 693 90135	BCP69-25
7216	9340 425 20115	BC847BS
7217	9352 780 22557	TDA15021H/N1B91
7219⚠	4822 209 60792	74HC4053D
7430	4822 130 11155	PDTC114ET
7436	9352 607 39118	74LVC14APW
7501	9322 199 16668	M74HC590T
7502	9322 201 05671	CY62256LL-70ZC
7503	9322 199 16668	M74HC590T
7504	3198 010 42310	BC847BW
7505	9351 870 00118	74HC573PW
7506	9351 870 00118	74HC573PW
7601	9322 183 05668	TS482ID
7602	9351 742 70118	74HC08PW
7603	3198 010 42310	BC847BW
7604	3198 010 42310	BC847BW
7605	9340 310 50215	PDTA143ET
7606	9340 425 20115	BC847BS
7708	9322 139 16668	LF33CPT
7710	9322 202 34668	L5973D
7730	9322 191 07668	IC SM L5970D
7735	4822 130 42804	BC817-25
7738	9322 163 24668	L78M08CDT
7741	3198 010 42310	BC847BW
7742	3198 010 42310	BC847BW
7752	5322 209 90529	MC34063AD
7756	4822 130 11155	PDTC114ET
7758	9322 212 14668	SI4423DY
7801	9322 219 57671	GM1501H-LF-BD
7900	9322 142 88668	LF25CDT
7901	9322 189 19668	LD1086D2T18
7A00	9352 759 98118	PCA9515ADP
7A02	3198 010 42310	BC847BW
7A03	3198 010 42310	BC847BW
7B01	9322 214 42671	K4D263238F-QC50
7C00	9322 205 12671	MX29LV040QC-70G
7C01	9322 206 23668	M24C32-WMN6P
7C02	9322 215 39685	PST596JN
7E00	9322 195 23668	ADG733BRU
7E01	9322 199 80668	SM5301BS-G
7E02	9322 199 56668	ADG781BCP
7E03	4822 209 60792	74HC4053D
7E04	9352 607 39118	74LVC14APW
7E05	9352 607 39118	74LVC14APW
7F03	9322 206 24668	M24C02-WMN6P
7G03	3198 010 42310	BC847BW
7G05	3198 010 42310	BC847BW
7G10	4822 209 60792	74HC4053D
7L01	3198 010 42310	BC847BW
7L02	3198 010 42310	BC847BW
7L03	3198 010 42310	BC847BW
7L04	9322 212 77672	MST9883C-LF-110
7L05	4822 209 17398	LD1117DT33
7L06	9965 000 04199	BSN20
7L07	9965 000 04199	BSN20
7M00	9322 204 76671	T6TU5XBG-0001
7M01	9322 206 19672	MSM56V16160F-7T3-FG
7M03	9322 170 14668	LF15ABDT
7N01	9322 210 01668	EPCS4SI8N
7N02	9322 217 35671	EP1C12F256C8N
7N03	9340 425 20115	BC847BS
7N04	9322 210 59668	THC63LVDF84B
7P01	9322 170 14668	LF15ABDT
7P02	9322 201 03668	THC63LVDM83R

PDP Audio [C]

Various

1735	4822 267 10918	Connector 3p
1736	2422 025 10768	Connector 3p m
1M02	4822 267 10618	Connector 7p
1M06	2422 025 11244	Connector 7p m
1M52	2422 025 10769	Connector 9p m

2700	4822 126 14247	1.5nF 50V 0603
2701	4822 126 14249	560pF 10% 50V 0603
2703	2020 552 96683	220nF 10% 50V
2704	4822 124 11767	470µF 20% 25V
2705	4822 126 14249	560pF 10% 50V 0603
2706	5322 126 11579	3.3nF 10% 63V
2707	2222 580 15649	100nF 10% 50V 0805
2709	2020 552 96683	220nF 10% 50V
2710	2020 552 96683	220nF 10% 50V
2711	2022 552 05679	1µF 10% 16V 0805
2712	4822 126 14583	470nF 10% 16V 0805
2713	4822 126 13193	4.7nF 10% 63V
2715	4822 121 51252	470nF 5% 63V
2716	3198 017 31530	15nF 20% 50V 0603
2717	2022 552 05679	1µF 10% 16V 0805
2718	2222 580 15649	100nF 10% 50V 0805
2719	4822 126 14583	470nF 10% 16V 0805
2720	2020 021 91431	22µF 20% 100V
2721	2222 580 15649	100nF 10% 50V 0805
2722	4822 126 14583	470nF 10% 16V 0805
2723	2022 552 05679	1µF 10% 16V 0805
2726	4822 126 13193	4.7nF 10% 63V
2727	4822 126 14249	560pF 10% 50V 0603
2731	4822 126 14249	560pF 10% 50V 0603
2732	4822 126 14583	470nF 10% 16V 0805
2736	4822 121 51252	470nF 5% 63V
2737	3198 017 31530	15nF 20% 50V 0603
2739	2222 580 15649	100nF 10% 50V 0805
2741	4822 126 13883	220pF 5% 50V
2743	3198 016 31020	1nF 25V 0603
2744	2222 580 15649	100nF 10% 50V 0805
2745	2020 552 96683	220nF 10% 50V
2746	4822 124 11767	470µF 20% 25V
2747	2022 552 05679	1µF 10% 16V 0805
2748	4822 126 14247	1.5nF 50V 0603
2749	5322 126 11579	3.3nF 10% 63V
2751	4822 124 40433	47µF 20% 25V
2754	2020 021 91431	22µF 20% 100V
2770	3198 017 41050	1µF 10V 0603
2776	2020 021 91431	22µF 20% 100V
2780	4822 126 14583	470nF 10% 16V 0805
2789	4822 126 14583	470nF 10% 16V 0805
2791	4822 126 13879	220nF +80-20% 16V

3700	4822 051 30561	560Ω 5% 0.062W
3701	4822 051 30479	47Ω 5% 0.062W
3702	3198 021 38220	8.2kΩ 5% 0.062W 0603
3703	3198 021 38220	8.2kΩ 5% 0.062W 0603
3704	4822 117 13632	100kΩ 1% 0603 0.62W
3705	4822 051 30222	2.2kΩ 5% 0.062W
3706	4822 051 30682	6.8Ω 5% 0.062W
3707	4822 051 30393	39kΩ 5% 0.062W
3708	4822 051 30479	47Ω 5% 0.062W
3709	4822 051 30272	2.7kΩ 5% 0.062W
3710	4822 051 30393	39kΩ 5% 0.062W
3711	2322 762 60568	5.6Ω 5% 5% 2512
3712	4822 051 30272	2.7kΩ 5% 0.062W
3713	4822 051 30332	3.3Ω 5% 0.062W
3714	4822 051 30682	6.8Ω 5% 0.062W
3715	2322 762 60568	5.6Ω 5% 5% 2512
3716	4822 117 13632	100kΩ 1% 0603 0.62W
3717	4822 051 30222	2.2kΩ 5% 0.062W
3718	4822 051 30561	560Ω 5% 0.062W
3719	4822 051 30124	120kΩ 5% 0.062W
3720	4822 051 30479	47Ω 5% 0.062W
3721	4822 051 30471	47Ω 5% 0.062W
3722	4822 051 30124	120kΩ 5% 0.062W
3723	4822 051 30471	47Ω 5% 0.062W
3724	4822 051 30102	1kΩ 5% 0.062W
3725	4822 117 12925	47kΩ 1% 0.063W 0603
3726	4822 051 30153	15kΩ 5% 0.062W
3727	4822 051 30103	10kΩ 5% 0.062W
3728	4822 051 30153	15kΩ 5% 0.062W
3729	4822 117 12925	47kΩ 1% 0.063W 0603
3730	4822 051 30223	22kΩ 5% 0.062W
3731	4822 051 30102	1kΩ 5% 0.062W
3732	4822 051 30223	22kΩ 5% 0.062W
3733	4822 051 30562	5.6kΩ 5% 0.063W 0603
3734	4822 051 30223	22kΩ 5% 0.062W
3735	4822 117 12889	270kΩ 1% 0.063W 0603
3736	4822 117 12925	47kΩ 1% 0.063W 0603
3737	4822 117 12925	47kΩ 1% 0.063W 0603
3738	4822 117 13632	100kΩ 1% 0603 0.62W
3760	4822 051 30223	22kΩ 5% 0.062W
3764	4822 117 13632	100kΩ 1% 0603 0.62W
3765	4822 117 13632	100kΩ 1% 0603 0.62W
3777	4822 051 30102	1kΩ 5% 0.062W
3778	4822 051 30479	47Ω 5% 0.062W
3999	4822 051 30472	4.7Ω 5% 0.062W
9710	4822 051 20008	Jumper 0805
9711	4822 051 20008	Jumper 0805
9712	4822 051 20008	Jumper 0805
9713	4822 051 20008	Jumper 0805
9748	4822 051 20008	Jumper 0805
9757	4822 051 20008	Jumper 0805
9758	4822 051 20008	Jumper 0805
9759	4822 051 20008	Jumper 0805
9760	4822 051 20008	Jumper 0805
9761	4822 051 20008	Jumper 0805
9762	4822 051 20008	Jumper 0805
9763	4822 051 20008	Jumper 0805
9764	4822 051 20008	Jumper 0805
9765	4822 051 20008	Jumper 0805
9766	4822 051 20008	Jumper 0805
9768	4822 051 20008	Jumper 0805
9770	4822 051 20008	Jumper 0805
9790	4822 051 20008	Jumper 0805
9795	4822 051 20008	Jumper 0805
9796	4822 051 20008	Jumper 0805
9806	4822 051 20008	Jumper 0805
9807	4822 051 20008	Jumper 0805
9808	4822 051 20008	Jumper 0805

5700	2422 536 00942	33µH 20%
5701	4822 157 11716	Bead 30Ω at 100MHz
5702	2422 536 00942	33µH 20%
5705	4822 157 11411	Bead 80Ω at 100MHz
5708	4822 157 11411	Bead 80Ω at 100MHz

6700	4822 130 11522	UDZ15B
6702	9322 150 18685	BZX384-C47
6703	4822 130 10838	UDZ3.3B

7700	9322 202 89668	LM393P
7701	9352 729 65112	TDA8925ST/N1
7702	3198 010 42310	BC847BW
7705	3198 010 42310	BC847BW
7706	3198 010 42310	BC847BW
7707	3198 010 42310	BC847BW
7708	3198 010 42320	BC857BW
7709	3198 010 42310	BC847BW
7710	3198 010 42310	BC847BW
7711	3198 010 42320	BC857BW
7712	3198 010 42310	BC847BW
7713	3198 010 42310	BC847BW

LED Panel [J]

Various

0345	2422 025 18741	Connector 6p m
1040	9322 206 81667	TSOP34836YA1

⊣⊢

2040	4822 124 12095	100µF 20% 16V

-WW-

3040	4822 117 13597	330Ω 5% 0402 0.01W
3051	4822 051 30221	220Ω 5% 0.062W
3061	4822 051 30221	220Ω 5% 0.062W
3063	4822 117 13606	10kΩ 5% 0.01W 0402
3078	3198 031 02250	2.2MΩ 5% 0.1W 0402
9012	4822 117 13605	Jumper 0402
9041	4822 117 13605	Jumper 0402
9042	4822 117 13605	Jumper 0402
9062	4822 117 13605	Jumper 0402
9066	4822 117 13606	10kΩ 5% 0.01W 0402
9070	4822 117 13605	Jumper 0402
9081	4822 117 13605	Jumper 0402
9082	4822 117 13605	Jumper 0402
9111	4822 117 13605	Jumper 0402
9112	4822 117 13605	Jumper 0402
9115	4822 117 13605	Jumper 0402
9122	4822 117 13605	Jumper 0402

6051	9322 218 97685	SML-310VTK
6060	9322 134 46685	SML-310MT
6070	9322 140 63685	TEMD5000

7051	3198 010 42310	BC847BW
7052	3198 010 42310	BC847BW
7062	4822 130 60373	BC856B

11. Revision List

Manual xxxx xxx xxxx.0

- First release.